Supplement to
Form 20732
Machines 327K & 328K
(463)

SERVICE MANUAL
FOR
SINGER* SEWING MACHINES
OF
CLASSES 327K and 328K

Instructions which appear on **pages 4 to 79 of this binder generally** apply to Machines 327K and 328K.

Instructions which apply only to Machines 327K and 328K appear **in this supplement.**

For detailed information concerning operation, threading, choice of needles, etc., see instruction book supplied with the machine.
Machine 327K – Form K6474 Machine 328K – Form K6401

THE SINGER MANUFACTURING COMPANY

Insert in Form 20732 (463)

*A Trademark of THE SINGER MANUFACTURING COMPANY

DESCRIPTION

Machine 328K

For straight, zigzag and ornamental stitching
Electric power with built-in SNK2 Motor and Light
Lock stitch, reversible feed
Needle catalog 2020 (15x1) - threaded from front to rear
Single or two-needle stitching
Horizontal oscillating hook on a vertical axis, with stationary bobbin case, located in front of needle
Movable bobbin case cushion spring for easy removal of bobbin case
Clamp-type calibrated throat plate (throat plate lifting plate supplied with attachment set)
Semi-automatic bobbin winder attached to arm
Maximum width of zigzag stitch (bight) approximately 5/32 inch (4mm)
Machine is furnished with nine discs. Each disc produces a particular decorative stitch and is manually inserted on disc spindle in machine
Stitch width lever and needle position selector lever located at front of arm
Stitch width (bight) lever controls width of zigzag or decorative stitching
Needle position lever places stitching in left, center or right needle positions. Straight stitching is accomplished with lever set at "O" position
Hinged disc cover plate at top of arm hold two spool pins
Graduated stitch length indicator plate provides for delicate adjustment of stitch lengths above 20, and positive locked setting at maximum stitch length
Numerically graduated thread tension device, with central spacing disc for two needle sewing
Maximum stitch length 6 per inch
Needle bar stroke - 1.183 inches
Presser bar lift - .290 to .300 inch
Bed - 16-1/2 inches long - 7 inches wide
Working space at right of needle - 7-1/8 inches
Speed - up to 1100 R.P.M.

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Speed - up to 1100 R.P.M.

HINTS FOR ADJUSTERS AND MECHANICS

CHECK THESE POINTS WHEN A MACHINE BINDS

1. Sprung or cracked bed incurred during transit.
2. Bent arm shaft.
3. Arm shaft thrust collar (at front of arm) set too tight.
4. Arm shaft components displaced (driven forward) by in-transit blow on the hand wheel.
5. Gear mesh too tight. (See caution at top of page 17.)
6. Cam and gear set too close to driving worm on arm shaft.
7. Bent take-up lever.
8. Thread take-up stud set too tightly.
9. Misalignment of thread take-up lever link hinge stud.
10. Hook jammed with thread.
11. Bent needle bar.
12. Tightness in needle bar rocker bracket assembly.
13. Tightness of oscillating hook pitman.
14. Binding or end play in oscillating hook crank assembly.
15. Insufficient thread clearance.
16. Feed dog striking end of throat plate slots or rubbing against sides of throat plate.
17. Feed bar screw centers too tight.
18. Feed lifting connecting rod bent.
19. Feed lifting rock shaft and feed rock shaft screw centers too tight.
20. Feed fork bent.
21. Burrs or damage to bearing surfaces.
22. Tightness in needle position selector lever assembly.†

TO "RUN-IN" THE MACHINE

When a machine is completely assembled and adjusted, it should be checked for binding. Lubricate the machine, as instructed on pages 4 and 5. Then "run-in" the machine with an electric motor for from 5 to 10 minutes at a medium speed or until all moving parts run freely and smoothly when machine is turned over by hand.

"Running-in" a machine should be done after every general repair.

† Applies only to Machine 328K

PREPARATION OF MACHINE FOR INSPECTION

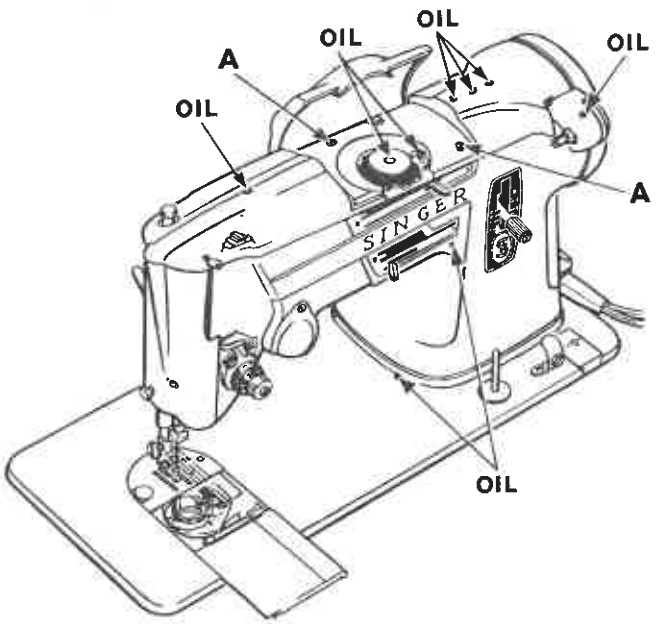
Before any extensive inspection is undertaken to find causes of faulty operation, machine should be thoroughly cleaned and oiled.

Remove all lint, dust or foreign particles and wipe machine clean and dry.

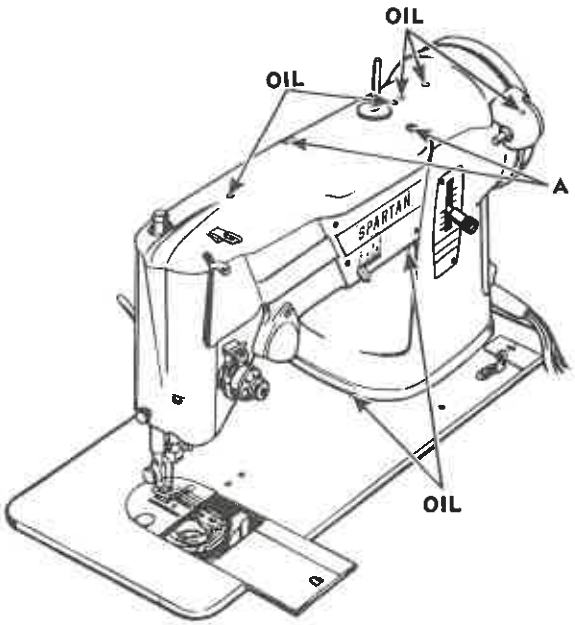
Oil as instructed below and on page 5 and wipe away all surplus oil.

NOTE: Under extreme conditions (if grease or dirt has become considerably hard or tacky), the motor, light and wiring harness should be removed, as instructed on pages 17 and 18, and the machine should be dipped in a tank of Varsol until the solids have been removed.

LUBRICATION



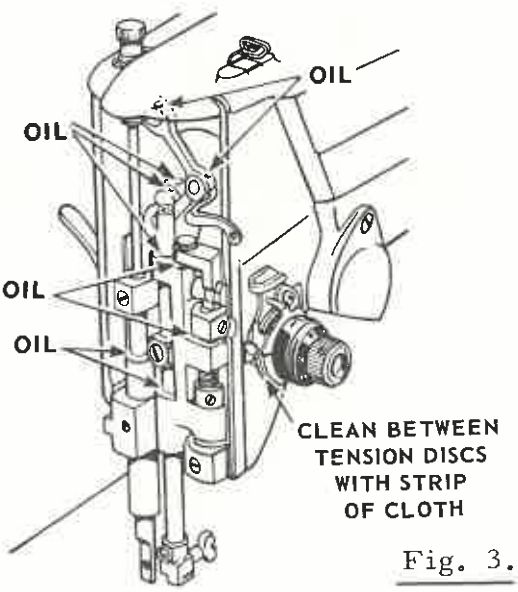
Machine 328K



Machine 327K

Fig. 2. Front View - Oiling

Machine 328K



Machine 327K

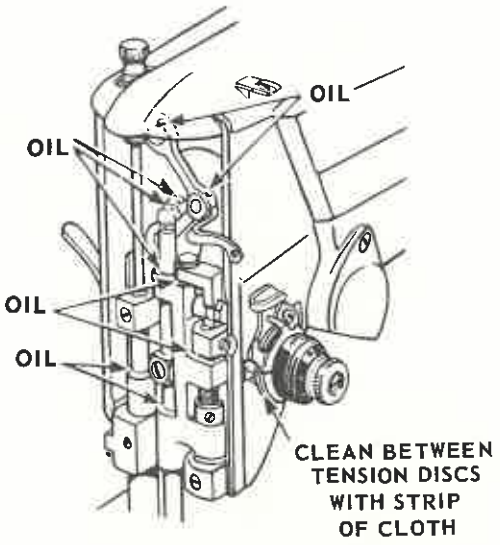


Fig. 3. End View - Oiling

Loosen two screws A. Fig. 2 and remove arm top cover. Apply SINGER* Gear Lubricant to gears as shown in Fig. 4.

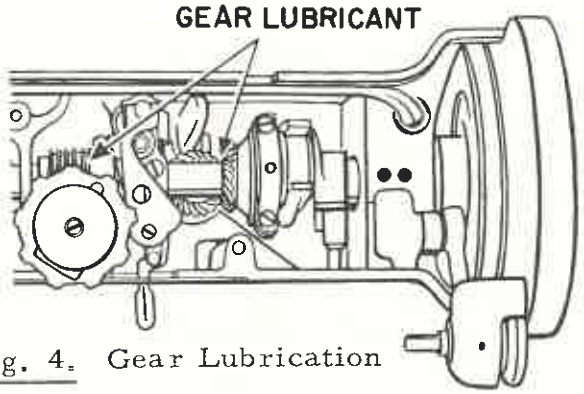


Fig. 4. Gear Lubrication

Remove bottom cover plate and apply oil to all points indicated below.

NEVER APPLY OIL OR GEAR LUBRICANT TO ANY PART OF MOTOR.

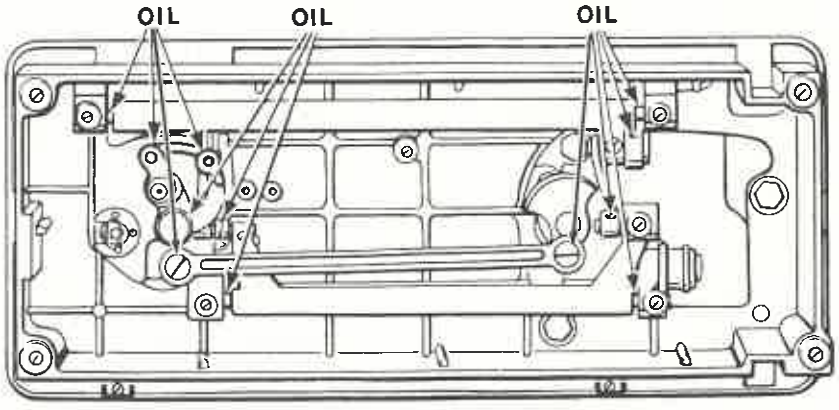


Fig. 5. Bottom View - Oiling

TO SET PRESSER FOOT AT CORRECT HEIGHT

IMPORTANT: Unless presser foot is set at correct height, attachments for these machines may not function properly on presser bar.

CAUTION: Throat plate must be flush with bed slide while setting presser foot height. Make certain needle clamp does not strike foot when foot is in raised position.

CHECK:

Raise presser bar lifter, raising presser foot to highest position. Bottom of presser foot should be approximately 5/16 inch above top of throat plate.

Test alignment of presser foot to feed slots in throat plate and to feed. Fig. 7 shows presser foot in correct alignment. Height and alignment of presser foot must be set at the same time. Test alignment using narrow hemmer foot (161671).

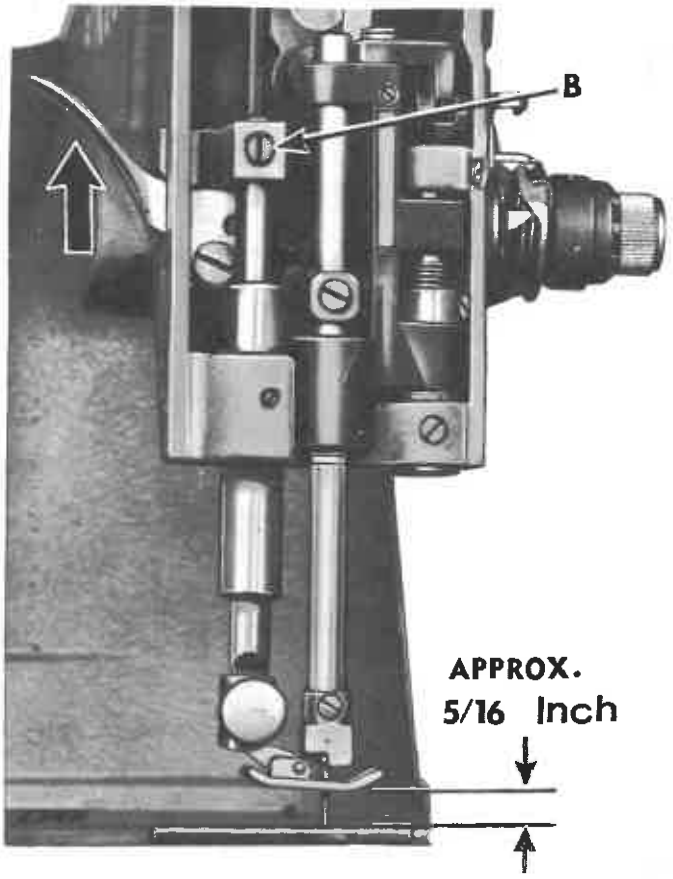


Fig. 6. Setting Presser Foot at Correct Height.

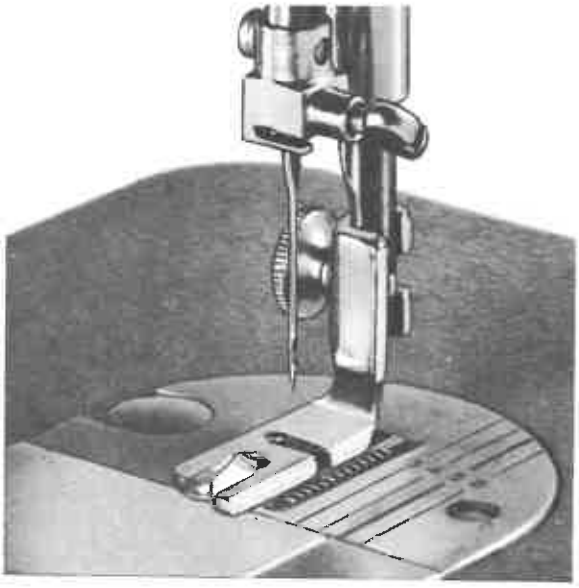


Fig. 7. Presser Foot in Alignment with Slots in Throat Plate and with Feed Dog.

SETTING:

1. Loosen set screw B, Fig. 6.
2. Raise or lower presser bar, as required.
3. Align presser foot and securely tighten set screw B.

TO SET FEED DOG AT CORRECT HEIGHT

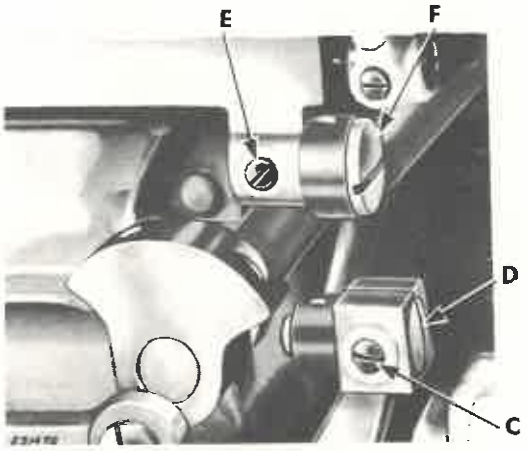


Fig. 8. Feed Adjustments

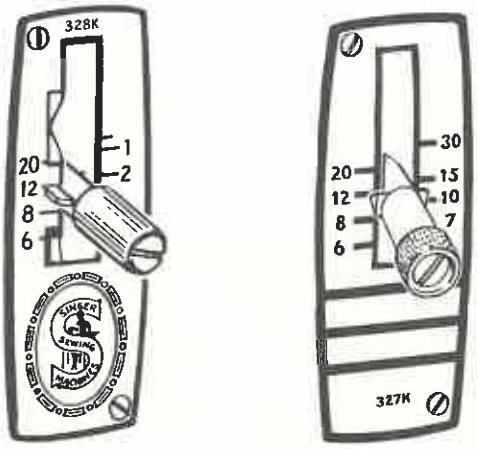


Fig. 8A. Stitch Length Regulator Set for 12 Stitches

PREPARATION:

1. Remove bottom cover.
2. Set stitch length regulator for 12 to 15 stitches per inch, as shown in Fig. 8A.
3. Turn hand wheel over toward you until feed dog is at its highest position.

CHECK:

With feed dog at its highest position, slightly less than a full depth of teeth should project above top surface of throat plate, as shown in Fig. 9.

SETTING:

1. Turn hand wheel over toward you to bring feed dog to its highest position.
2. Loosen set screw C, Fig. 8.
3. Turn eccentric stud D clockwise or counterclockwise, as required, to bring feed dog to correct height.
4. While maintaining this setting, securely tighten set screw C.

Fig. 9 Feed Dog at Correct Height

TO SET FEED DOG LENGTHWISE IN THROAT PLATE SLOTS

PREPARATION:

1. Set feed dog at correct height as instructed above.
2. Set stitch length regulator for 12 to 15 stitches per inch, as shown in Fig. 8A.

CHECK:

While turning hand wheel over toward you, feed dog should come as close as possible to front of throat plate slots without striking throat plate.

SETTING:

1. Loosen set screw E, Fig. 8.
2. Turn eccentric stud F, moving feed dog toward front or rear to correct direction required.
3. While correct setting is maintained, securely tighten set screw E.

TO SET FEED DOG SIDEWISE IN THROAT PLATE SLOTS AND TO ELIMINATE END PLAY OR BINDING OF FEED ROCK SHAFT AND FEED LIFTING ROCK SHAFT

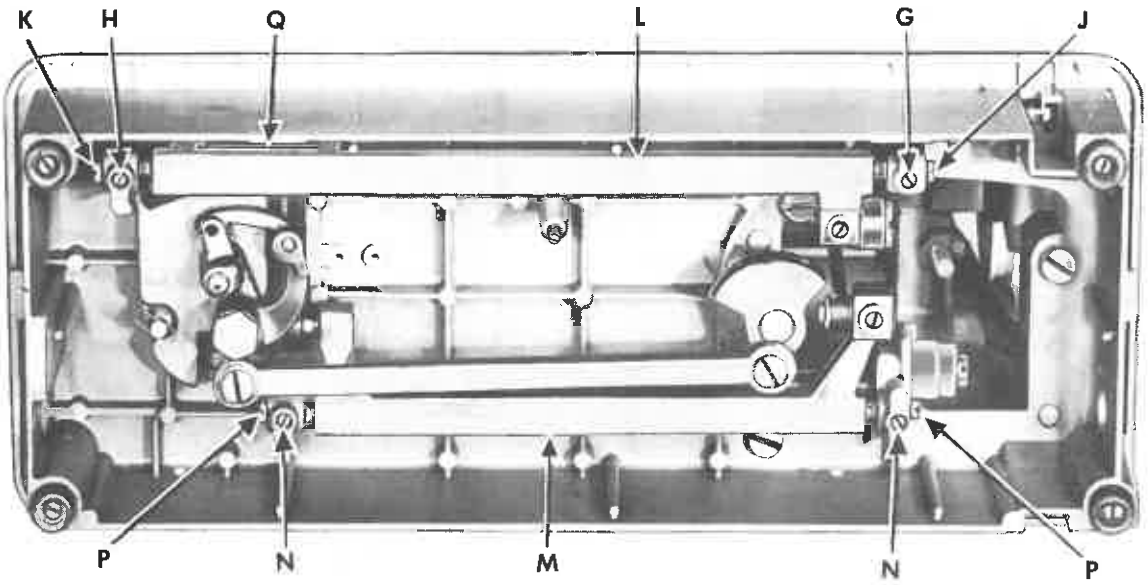


Fig. 10. Setting Feed Dog Sidewise and Adjusting for End Play or Binding

PREPARATION:

1. Remove bottom cover plate.
2. Set feed dog at correct height as instructed on page 7.

CHECK:

Feed dog should be located centrally (along the bed) in feed slots of throat plate.

SETTING: (See Fig. 10.)

1. Loosen set screws G and H which hold screw centers J and K and feed rock shaft L in position.
2. To position feed dog toward left, loosen screw center K and tighten screw center J an equal amount, as required.
3. To position feed dog toward right, loosen screw center J and tighten screw center K an equal amount, as required.
4. When feed dog is centralized in throat plate, make certain that screw centers J and K hold feed rock shaft L snugly (without end play or binding).
5. Then securely tighten screws G and H.

CHECK FOR BINDING OR END PLAY OF FEED LIFTING ROCK SHAFT.

SETTING:

1. Loosen set screw N which hold screw center P and feed lifting rock shaft M in position.
2. Tighten screw centers P equally upon shaft M so that shaft M rides freely without end play or binding.
3. Then securely tighten screws N.

Should feed shafts L and M still bind, check feed bar Q for end play or binding.

SETTING:

Remove feed rock shaft and feed bar assembly as instructed on page 23, and adjust feed bar screw centers as required.

THREAD CONTROLS
TO SET THE TAKE-UP SPRING
Machine 328K

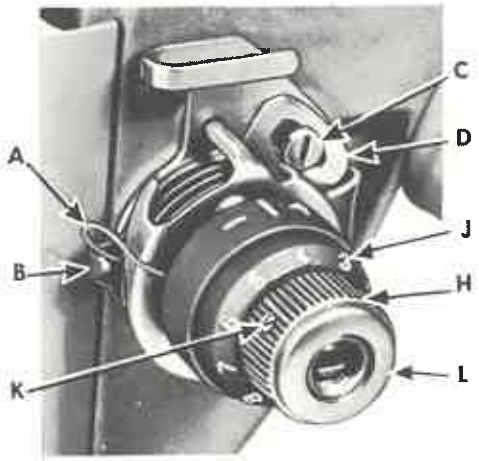


Fig. 11. Setting the Stroke

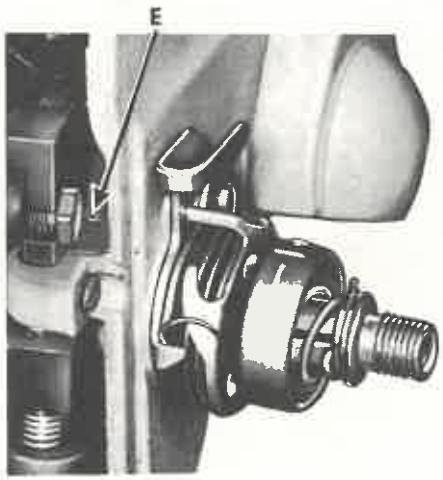


Fig. 12. Stud Set Screw

SETTING THE STROKE: (See Fig. 11)

The take-up spring A should complete its action and be at rest against stop B as point of needle enters fabric.

Loosen screw C and move slack regulator D down (to the right) to complete take-up spring action earlier (shorter stroke); move regulator D up (to the left) to complete take-up spring action later (longer stroke).

Then tighten screw C.

SETTING THE TENSION:

Tension on take-up spring should be just sufficient to take up slack of needle thread until point of needle reaches fabric.

Loosen stud set screw E, Fig. 12 and remove entire tension assembly. Turn numbered dial to "O" releasing all tension. Hold tension assembly so that component parts are in position shown by dotted line in Fig. 13. Place spring end F in groove of sprocket G so that take-up spring A hangs down in a vertical position. This is the normal setting.

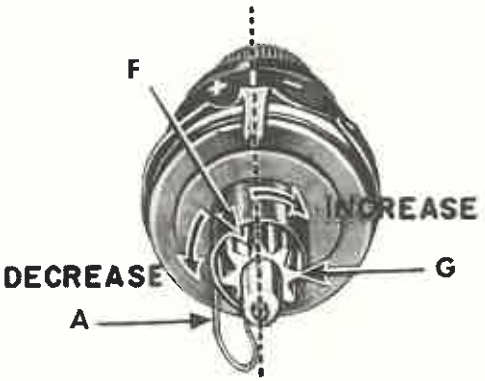


Fig. 13. Setting the Tension

To increase tension on take-up spring, move spring end F right to next groove of sprocket G; to decrease tension, move spring end left to next groove.

Replace assembly, draw take-up spring so that it rests on regulator stop B, Fig. 11 and recheck tension. Tighten stud set screw E, Fig. 12.

THREAD CONTROLS (CONT'D)

TO SET THE TAKE-UP SPRING

Machine 327K

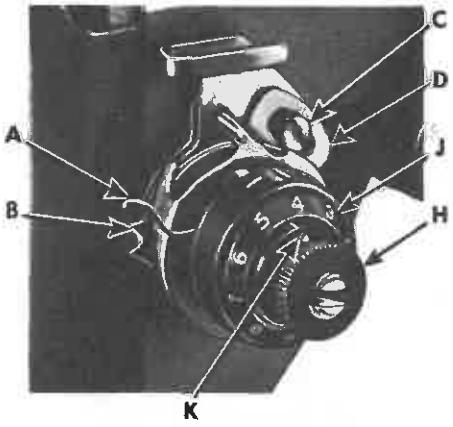


Fig. 14. Setting the Stroke

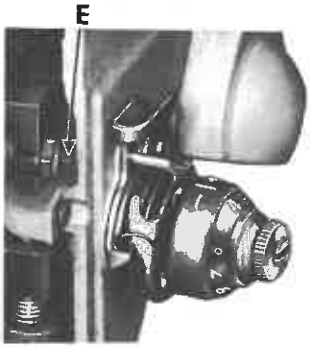


Fig. 15. Stud Set Screw

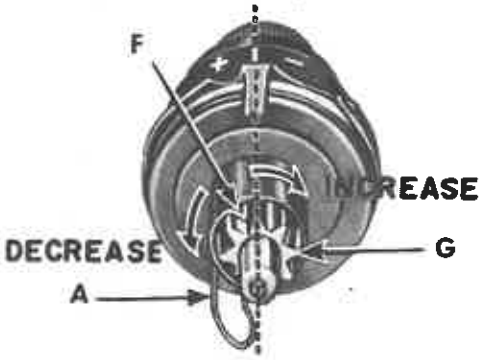


Fig. 16. Setting the Tension

TIMING THE STROKE: (See Fig. 14)

The take-up spring A should complete its action and be at rest against stop B as eye of needle enters fabric.

Loosen screw C and move slack regulator D down (to the right) to complete take-up spring action earlier (shorter stroke); move regulator D up (to the left) to complete take-up spring action later (longer stroke).

Then tighten screw C.

SETTING THE TENSION:

Tension on take-up spring should be just sufficient to take-up slack of needle thread until point of needle reaches fabric.

Loosen stud set screw E, Fig. 15 and remove entire tension assembly. Turn numbered dial to "O" releasing all tension. Hold tension assembly so that component parts are in position shown by dotted line in Fig. 16. Place spring end F in groove of sprocket G so that take-up spring A hangs down in a vertical position. This is the normal setting.

To increase tension on take-up spring, move spring end F right to next groove of sprocket G; to decrease tension, move spring end left to next groove.

Replace assembly, draw take-up spring so that it rests on regulator stop B, Fig. 14, and recheck tension. Tighten stud set screw E, Fig. 15.

TO ADJUST NEEDLE THREAD TENSION

Machine 328K

1. Use #50 mercerized thread.
2. Lower presser bar to engage tension.
3. Turn thumb nut H, Fig. 11, together with dial J, over toward left as far as it will go. At this setting there should be a slightly perceptible tension on needle thread.

ADJUSTMENT:

1. Loosen set screw K and remove thumb nut H with cap L.
2. Remove dial J.
3. Place thread between tension discs and turn adaptor M, Fig. 17 as required, to obtain a slightly perceptible tension.
4. Replace dial J, Fig. 11 so that stop on inside of dial is to right of stop washer extension N, Fig. 17.
5. Hold dial J, Fig. 11 against tension assembly and tighten nut H (open side out) against dial.

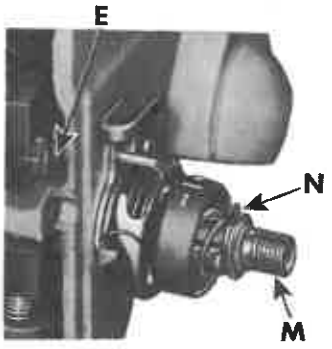


Fig. 17. Adjust Tension

6. Place cap L into nut H and tighten set screw K.
7. Recheck tension on needle thread.

NOTE: When adjusting for ZigZag stitching a lighter needle thread tension is required. The wider the ZigZag stitch the lighter the tension needed.

THREAD CONTROLS (CONT' D)

TO ADJUST NEEDLE THREAD TENSION

Machine 327K

CHECK:

1. Use #50 mercerized thread.
2. Lower presser bar to engage tension.
3. Turn thumb nut H, Fig. 14, together with dial J over toward left as far as it will go. At this setting "O", there should be a slightly perceptible tension on needle thread.

ADJUSTMENT:

Pull thread through tension discs to test amount of tension on thread at "O" position. At this point there should be a slight pull on the thread to indicate there is minimum tension which gradually increases with the turning of thumb nut H to the right, providing a full range of tension with one revolution of the thumb nut. If the pull is too strong for a minimum tension, press in dial J to disengage pin K on nut from dial, and reset pin in next hole to left of previous setting. Repeat this adjustment until a point of no tension is reached. Then advance on hole to right to give minimum tension at zero position.

TO ADJUST THREAD CLEARANCE

PREPARATION:

Open slide plate and remove throat plate.

CHECK:

Using a narrow Feeler Gauge, check clearance between heel of bobbin case and cushion spring. Clearance should be .016 to .020 inch, as shown at right. Hold to lower dimension to reduce bobbin case noise.

SETTING: (See Fig. 18)

1. Loosen screws A and B.
2. Insert Feeler Gauge (.016-.020 inch) between spring and heel of bobbin case, and move cushion spring to bear against blade of Feeler Gauge.
3. Securely tighten screws A and B.

NOTE: Washer and hole in spring for screw A are oversized to permit adjustment for correct clearance.

Inspect cushion spring and screws A and B for wear and possible need for replacement.

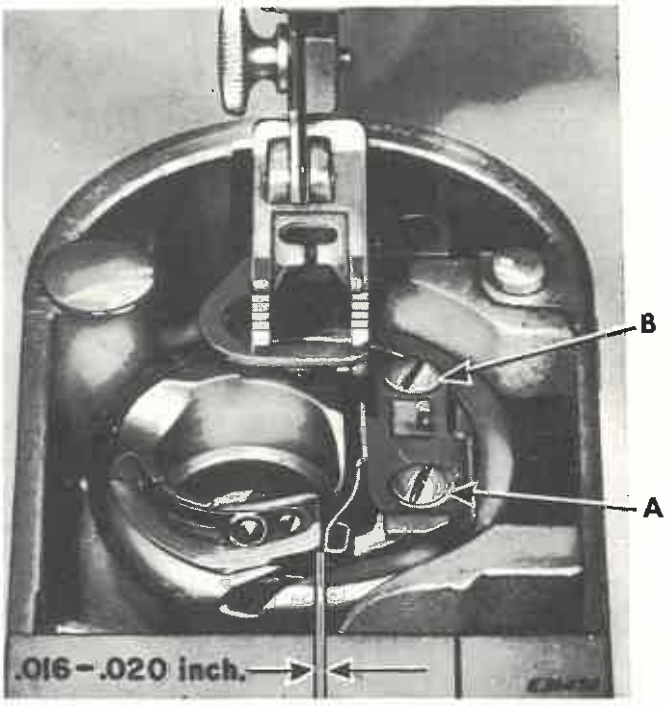


Fig. 18. Thread Clearance

FEED TIMING

CAUTION: Feed eccentric is correctly set at the factory.

This timing should not be altered.

TO CHECK THE POSITION OF THE NEEDLE IN RELATION TO STRAIGHT-STITCHING THROAT PLATE

PREPARATION:

1. Install straight-stitching throat plate.
2. Set needle position selector lever at "C"† and stitch width lever at "O".

CHECK:

When needle enters the needle hole in straight-stitching throat plate, the short-groove (flat shank) side of the needle should face slightly to left of rear, as shown in Fig. 19.

Although the size of the needle may be changed to suit sewing requirements, the position of the flat shank side of the needle remains CONSTANT in relation to the needle hole in the throat plate.

Observe that the center of a Size #11 needle should be at the approximate center of the needle hole in the throat plate and that the center of each larger size needle advances toward the front of the needle hole.

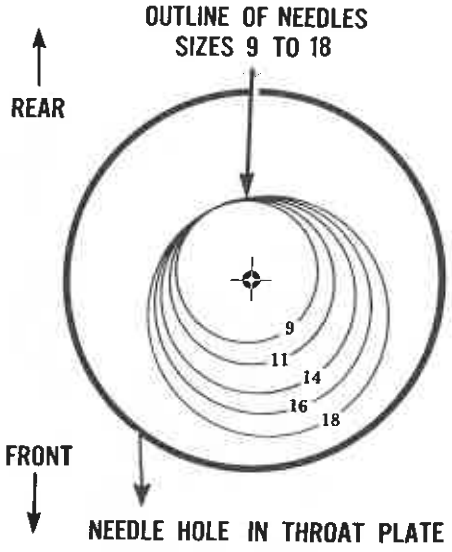


Fig. 19. Needle Hole in Straight-Stitching Throat Plate

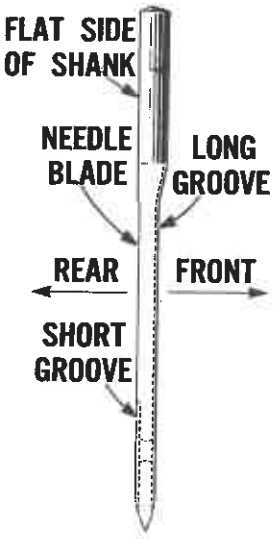


Fig. 20. 15 x 1 Needle (Catalog #2020)

This position is necessary to permit an increase in the diameter of the needle blade toward the front without disturbing the proper relationship between the needle and the sewing hook. This position of the needle will also maintain sufficient clearance for the needle thread.

At no time should the needle touch the edge of the needle hole. The needle should never strike the presser foot.

If the needle is incorrectly located in the throat plate hole:-

1. Needle bar setting may be incorrect from front to back or from right to left (See pages 29 and 30).

2. Needle or needle bar may be bent. (Replace)
3. Needle seat in needle bar may be clogged with dirt or may be damaged.

† Applies only to Machine 328K

TO CHECK THE POSITION OF THE NEEDLE IN RELATION TO STRAIGHT-STITCHING THROAT PLATE (Cont'd)

4. Throat plate may be incorrectly seated.

If the needle strikes the presser foot, any of the above conditions may be at fault, or:-

1. Presser bar may be bent, damaged or turned out of position (see page 6).
2. Presser foot may be incorrectly seated on presser bar.
3. Presser foot may be bent. (Replace)

TO SET NEEDLE BAR AT CORRECT HEIGHT

PREPARATION:

1. Set needle position lever at "C"† and stitch width lever at "O".
2. Insert a size #18 needle into needle clamp.

CHECK:

1. Turn hand wheel over toward you until needle bar is at its lowest point. At this position, the UPPER TIMING MARK on needle bar should be aligned with lower end of needle bar frame, as shown in Fig. 21.
2. Then turn hand wheel over toward operator until hook point is behind needle. If needle bar is correctly timed the lower timing mark should be aligned with lower end of needle bar frame.

SETTING:

1. With needle bar at its lowest point, loosen clamping screw R and raise or lower needle bar as required.
2. While maintaining correct needle bar height, make certain that needle bar is correctly turned (needle clamp and thumb screw should be parallel with front end of machine bed).
3. Then tighten clamping screw R.

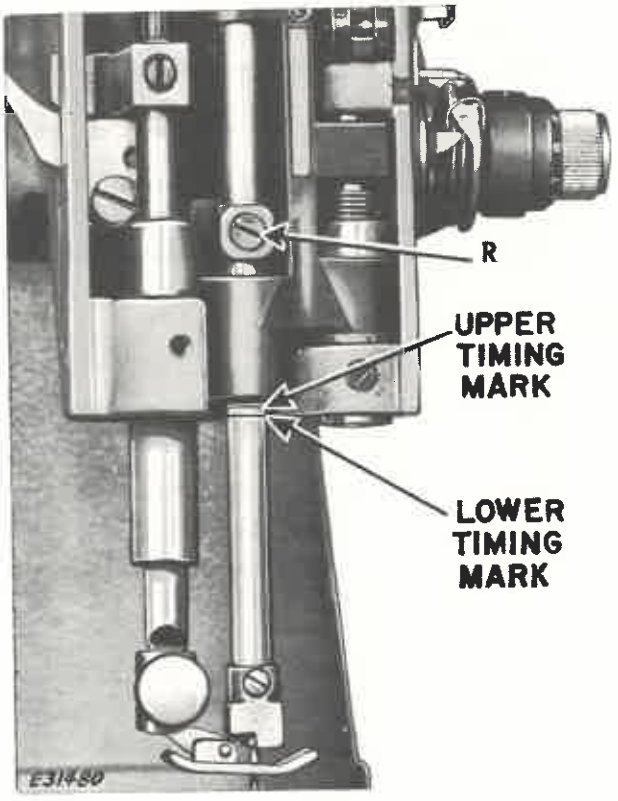


Fig. 21. Setting Needle Bar At Correct Height

† Applies only to Machine 328K

TO ELIMINATE END PLAY OR BINDING OSCILLATING HOOK SHAFT AND OSCILLATING HOOK CRANK

To eliminate end play or binding of hook shaft S and crank T, loosen set screw U. Then, while pressing downward upon hook from top of machine, set crank T with medium pressure against hexagon nut V.

Securely tighten set screw U making certain it enters timing groove of hook shaft S. Then test for free running qualities.

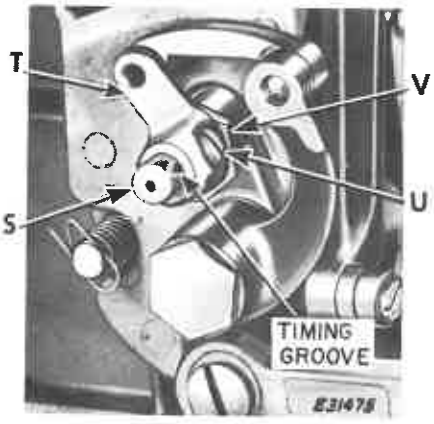


Fig. 22. Adjustment for End Play or Binding of Hook Shaft and Crank.

TO ELIMINATE END PLAY OF UPRIGHT ARM SHAFT

CAUTION. Do not disturb mesh between bevel gears when making any adjustments of upright and horizontal arm shafts. These gears have been lapped together at the factory and should be kept in mesh throughout all adjustments or replacements.

End play in upright arm shaft may be due to excessive clearance between top of upright arm shaft and horizontal arm shaft.

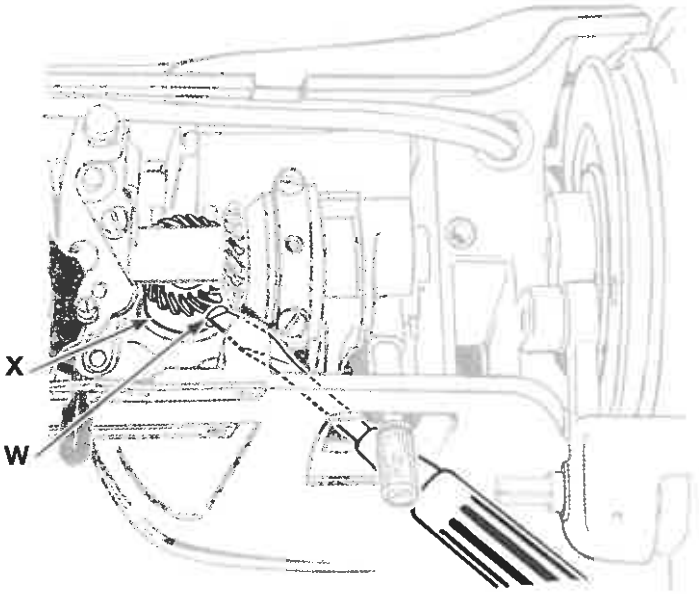


Fig. 23. Adjustment for End Play of Upright Arm Shaft

PREPARATION:

1. Remove arm top cover and bottom cover plate.
2. Remove two screws which fasten stitch length indicator plate to machine arm. (Allow indicator plate to hang freely on stitch length lever.)

ADJUSTMENT:

1. Swing indicator plate on lever and insert screw driver through cutout in machine arm, as shown in Fig. 23.
2. Turn hand wheel over toward you until set screw W in bevel gear X is accessible to screw driver. Then loosen screw W 1/4 turn.
3. While pressing down upon bevel gear X, press upright arm shaft (from underside of machine) up against the horizontal arm shaft. Then securely tighten gear set screw W.
4. Replace stitch length indicator plate, arm top cover, and bottom cover plate.

TO ELIMINATE END PLAY OR BINDING OF HORIZONTAL ARM SHAFT

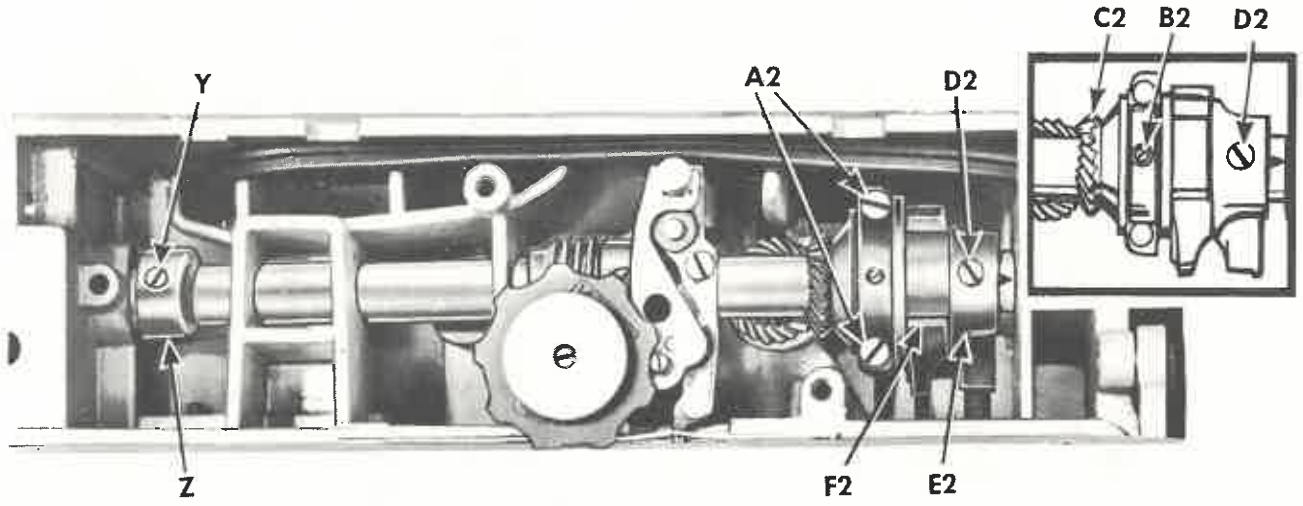


Fig. 24. Adjustment for End Play or Binding of Horizontal Arm Shaft

When horizontal arm shaft binds, first check to make certain that mesh between arm shaft worm gear and cam stack worm wheel is not too tight. Do this by setting the cam stack as instructed on page 35 and 36.

If arm shaft still requires adjustment for end play or binding, loosen set screw Y in collar Z. Push needle bar crank toward hand wheel end of machine while firmly pressing collar Z against bushing in machine head. Then tighten set screw Y.

If arm shaft still binds, remove the two connecting rod cap screws A2 and remove connecting rod cap. Turn hand wheel until timing screw B2 appears in bevel gear C2, as shown in Fig. 24 (Inset). Then loosen timing screws B2 and D2.

While keeping timing screws B2 and D2 aligned with timing groove of arm shaft, press bevel gear C2 into mesh with bevel gear at top of upright arm shaft, without backlash or binding. Then tighten timing screw B2.

Press feed eccentric E2 gently against feed forked connection F2 and tighten timing screw D2.

Apply SINGER Gear Lubricant to gears and check for free running of horizontal arm shaft.

Replace connecting rod cap and fasten with cap screws A2.

TO TIME THE OSCILLATING HOOK

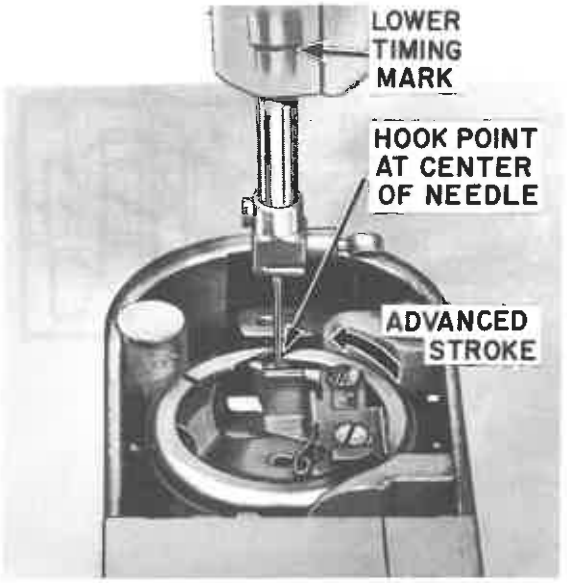


Fig. 25. Hook Correctly Timed

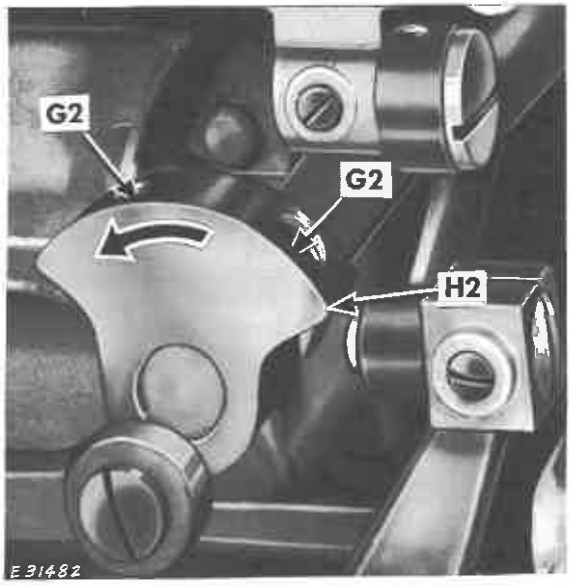


Fig. 26. To Time the Hook

PREPARATION:

1. Set needle bar at correct height as instructed on page 12.
2. Time needle bar vibrating mechanism as instructed on pages 29, 30 and 31.
3. Insert a size #18 needle correctly into needle clamp.
4. Remove bottom cover plate, presser foot, throat plate and bobbin case. (Feed dog is removed in Fig. 25 to show point of hook, but it need not be removed to time the hook.)
5. Set needle position selector at "C"† and stitch width lever at "O".

CHECK:

Turn hand wheel over toward you until lower timing mark, Fig. 25 is aligned with lower edge of needle bar frame on upward stroke of needle bar.

At this position of needle bar, point of hook should be at center of needle, as shown in Fig. 25.

SETTING:

If timing is incorrect;
1. Loosen the two socket set screws G2, Fig. 26, in crank H2. (Use 1/8 inch socket wrench.)
2. While maintaining correct position of needle bar (lower timing mark aligned with lower edge of needle bar frame), turn crank H2 counter-clockwise until hook point, on its advanced stroke, is located directly behind center of needle, as shown in Fig. 25.
3. Without disturbing position of crank H2, press crank firmly against casting and tighten socket set screws G2.
4. Replace bottom cover plate, bobbin case, throat plate and presser foot.

† Applies only to Machine 328K

REMOVALS AND REPLACEMENTS

UPRIGHT ARM SHAFT

CAUTION: Do not remove the upright arm shaft from this machine. If this becomes necessary, the machine should be returned to the factory.

The two bevel gears have been lapped together at the factory and should be kept in mesh throughout all other removals and replacements. Disturbing the gear mesh causes objectionable gear noises.

THE MOTOR

CAUTION: Remove plug from electric outlet before removing any electrical part from machine.

REMOVAL: (See Fig. 27)

1. Remove motor cover plate C3.
2. Remove hand wheel as instructed on page 21.
3. Remove terminal cover plate D3.
4. Using cutting pliers, cut off crimped ends of wire (lead) connectors J3.
5. Loosen screw E3 and raise bracket post F3 until it clears upper motor bracket G3.
6. While holding motor in position, remove lower bracket screw K3, with its insulating bushing L3 and sleeve M3.
7. Remove motor from machine arm.

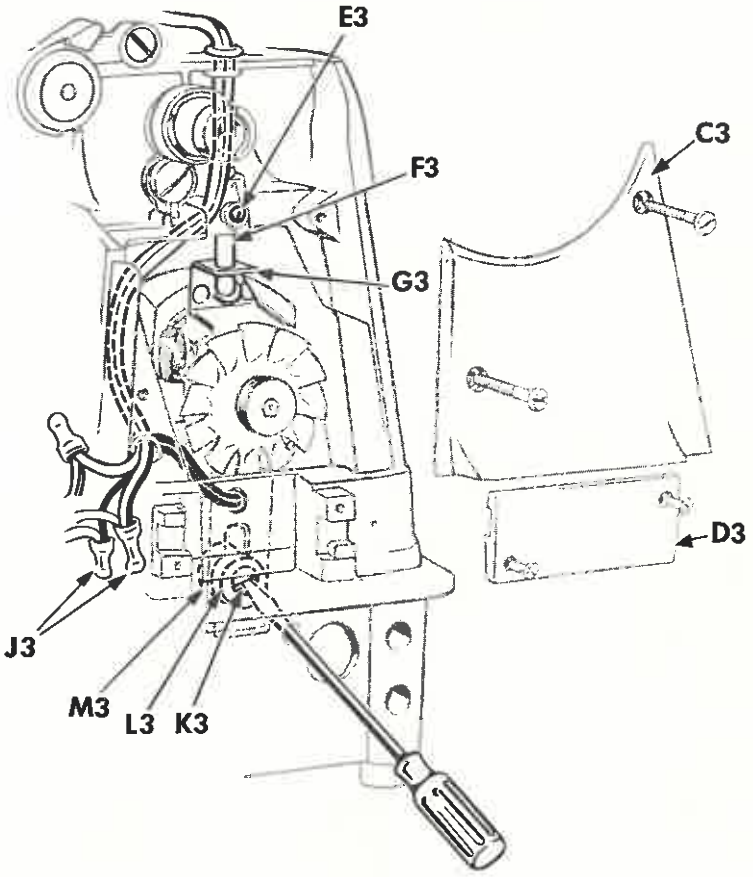


Fig. 27. Removing the Motor

REPLACEMENT:

1. Install motor into machine arm and lower bracket post F3 through upper motor bracket G3, then tighten screw E3.
2. With screw K3 and bushing L3 assembled to slot of lower motor bracket, fit sleeve M3 on bushing L3 and fasten entire assembly to machine bed.
NOTE: Do not tighten screw K3 until final adjustment is made.
3. Guide motor leads from inside of arm through rubber grommet.
4. Replace hand wheel assembly (with motor belt in place) on arm shaft.
5. Raise motor and guide belt around motor pulley.
6. Lower motor until sufficient tension on belt is obtained. Then tighten bracket screw K3.
7. Connect motor leads to light and controller leads as shown in WIRING DIAGRAM on page 40. Apply wire nuts to spliced leads and secure by covering with electrical tape.
8. Replace motor cover plate C3 and terminal cover plate D3.

REMOVALS AND REPLACEMENTS
THE LIGHT FIXTURE

REMOVAL:

1. Remove screw N3 and cover P3, Fig. 28, also remove light guard Q3,† Fig. 29.
2. Remove bulb R3.
3. Remove light socket screw S3, Fig. 30 at rear of machine.
4. Remove arm top cover, motor cover plate, terminal cover plate (see page 17) and hand wheel assembly (see page 21).
5. Using cutting pliers, cut off crimped ends of the two large connectors which connect the light lead to motor, controller and line leads. (See Wiring Diagram on page 40.)
6. Remove light socket with its leads from arm of machine.

REPLACEMENTS:

1. Install light fixture in reverse order of its removal. Make certain that rubber grommets, through which leads pass, are positioned correctly in casting.
2. Guide leads into recess provided for them in machine arm (see Fig. 30A) and, from inside through lower grommet, as shown in Fig. 27 on page 17.
3. Connect light leads to motor, controller and line leads as shown in Wiring Diagram on page 40.
4. Secure light socket to arm with light socket screw S3, Fig. 30.
5. Replace bulb R3 and light guard Q3,† Fig. 29.
6. Replace lamp cover P3, and fasten with screw N3, Fig. 28.
7. Replace hand wheel assembly with motor belt in groove of hand wheel, and guide belt around motor pulley. Then replace motor cover plate, terminal cover plate and arm top cover.
8. Check light fixture by inserting line plug into electrical outlet.

† Applies only to Machine 328K

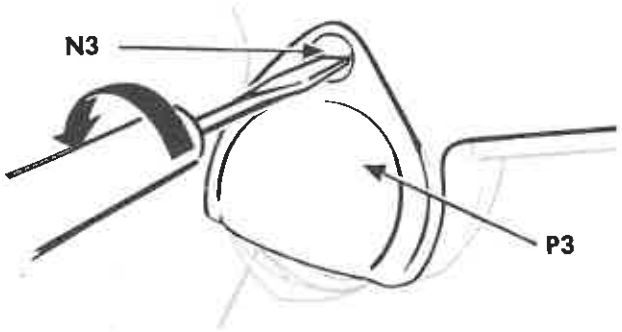


Fig. 28. Removing Light Cover

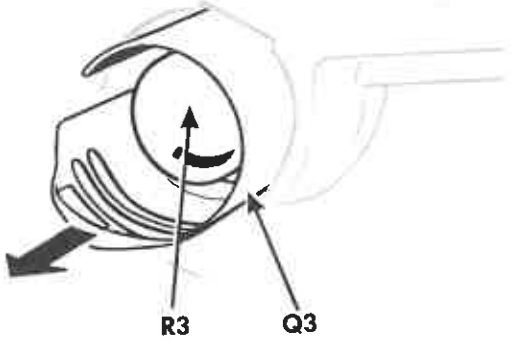


Fig. 29. Removing Light Guard †

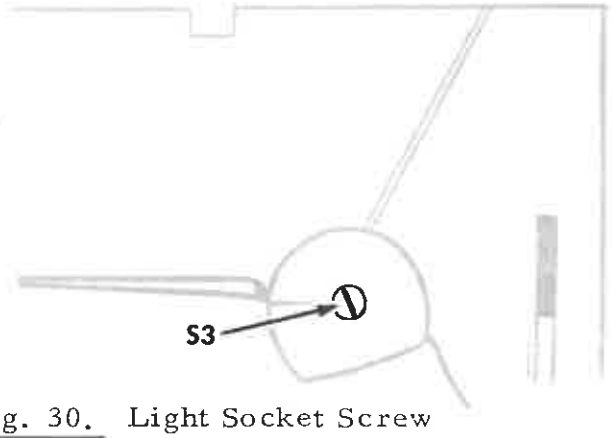


Fig. 30. Light Socket Screw

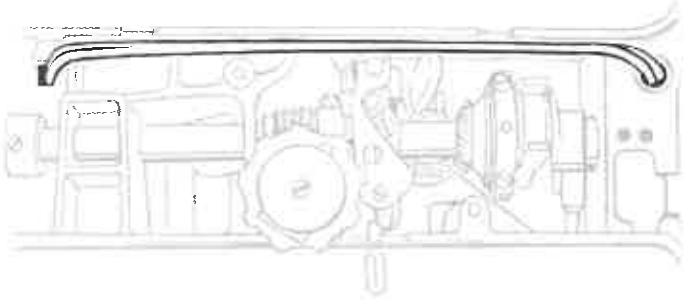


Fig. 30A. Light Leads in Machine Arm

REMOVALS AND REPLACEMENTS
NEEDLE THREAD TENSION
Machine 328K

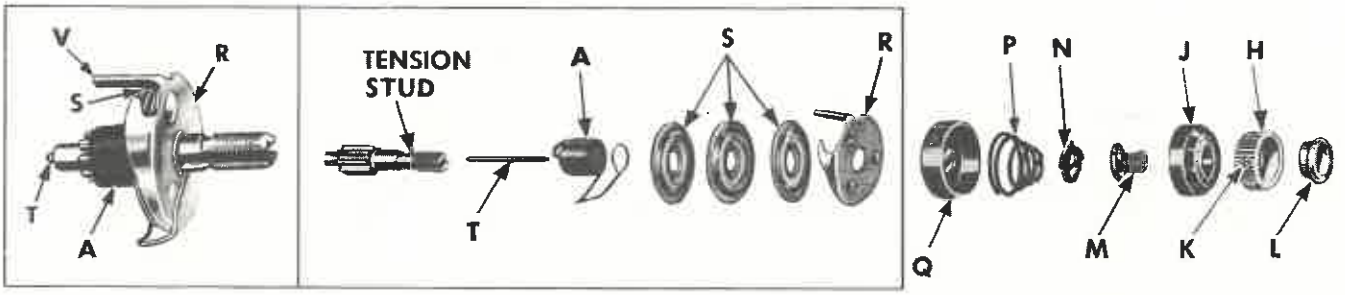


Fig. 31. Needle Thread Tension Assembly

REMOVAL: (See Fig. 31.)

1. Loosen set screw K.
2. Turn thumb nut H to left (counter-clockwise) to remove nut H and cap L.
3. Remove tension dial J.
4. Turn adaptor M to left (counter-clockwise) to remove it from tension stud.
5. Remove stop washer N, spring P and tension indicator Q from tension stud.
6. Then, as a unit, remove tension disc assembly (thread guard R, tension discs S and take-up spring A).
7. Remove tension releasing pin T.

NOTE: It is not necessary to remove tension stud from machine. It is shown removed in Fig. 31 to illustrate complete assembly. See page 9 for instructions on removal of tension assembly as a unit.

REPLACEMENT:

1. Make certain that tension releasing pin T is in place as shown in inset, Fig. 31.
2. Place tension discs on thread guard R as shown in Fig. 32.
3. Pass take-up spring eyelet U under thread guard with coils of spring above tension discs as shown in Fig. 32
4. Align coils of spring with holes in discs and place this assembly on tension stud as shown in inset, Fig. 31. Extension V of thread guard R enters hole provided in machine head.

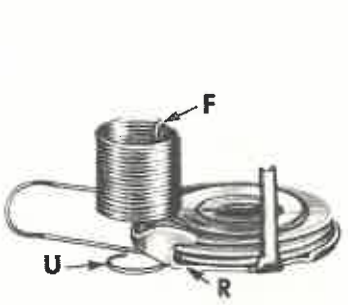


Fig. 32.

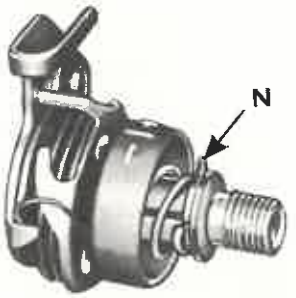


Fig. 33.

NOTE: Tail F, Fig. 32 enters one of the grooves in rear of tension stud (see instructions "SETTING THE TENSION" on page 9).

5. Replace indicator Q, Fig. 31 with open side facing out and with plus (+) and minus (−) signs at top.
6. Hold these assembled parts against shoulder of stud and place tension spring P, Fig. 31 on tension stud.
7. Place stop washer N on stud so that its extension is above tension stud, as shown in Fig. 33.
8. Replace adaptor M on tension stud.
9. Place thread between tension discs and turn adaptor M as required, to obtain a slightly perceptible tension on thread.

10. Replace dial J so that stop on inside of dial is to right of stop washer extension N.
11. Hold dial J against tension assembly and tighten nut H (open side out) against dial.
12. Place cap L into nut H and tighten set screw K.

REMOVALS AND REPLACEMENTS
NEEDLE THREAD TENSION
Machine 327K

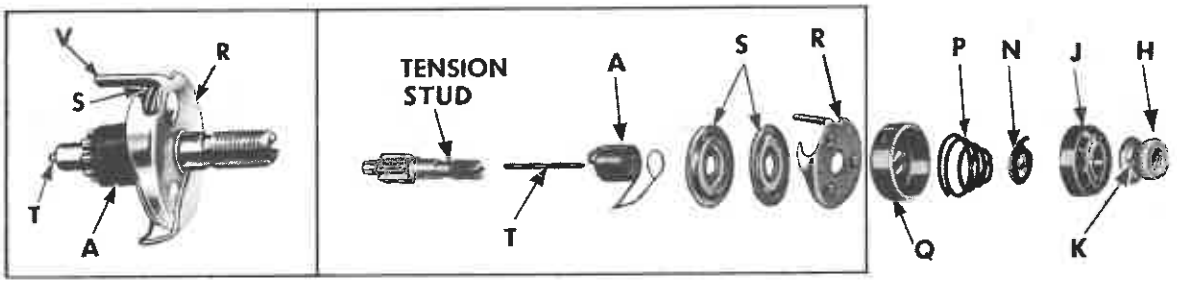


Fig. 34. Needle Thread Tension Assembly

REMOVAL: (See Fig. 34)

1. Turn thumb nut H to left (counter-clockwise) until "Q" on numbered dial J stops at center line on indicator Q, Fig. 34.
2. Press in dial J, separating pin K in thumb nut H from hole in dial J; unscrew thumb nut H and remove it from tension stud.
3. Remove stop washer N, spring P and tension indicator Q from tension stud.
4. Then, as a unit, remove tension disc assembly (thread guard R, tension discs S and take-up spring A).
5. Remove tension releasing pin T.

NOTE: It is not necessary to remove tension stud from machine. It is shown removed in Fig. 34, to illustrate complete assembly. See page 10 for instructions on removal of tension assembly as a unit.

REPLACEMENT:

1. Make certain that tension releasing pin T is in place as shown in inset, Fig. 34.
2. Place tension discs on thread guard R as shown in Fig. 35.
3. Pass take-up spring eyelet U under thread guard with coils of spring above tension discs as shown in Fig. 35.
4. Align coils of spring with holes in discs and place this assembly on tension stud as shown in inset Fig. 34. Extension V of thread guard R enters hole provided in machine head.

NOTE: Tail F, Fig. 35, enters one of the grooves in rear of tension stud (see instructions "SETTING THE TENSION" on page 10).

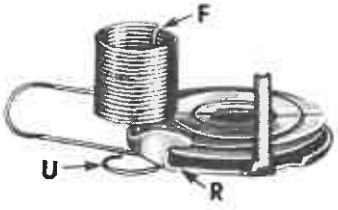


Fig. 35. Tension Disc Assembly

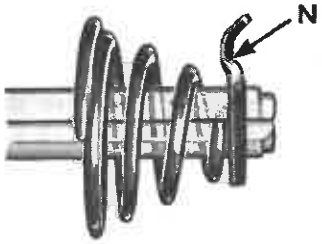


Fig. 36. Stop Washer and Tension Spring

5. Replace indicator Q, Fig. 34 with open side facing out and with plus (+) and minus (-) signs at top.
6. Hold these assembled parts against shoulder of stud and place tension spring P, Fig. 34, so that the half coil at front is in the lower position, on tension stud.
7. Place stop washer "N" on stud so that its extension points upward away from machine on tension stud as shown in Fig. 36.
8. Replace numbered dial J so that stop on inside of dial is to right of stop washer extension N.
9. Push dial J to compress spring to facilitate replacement of thumb nut H.
10. Replace thumb nut H, carefully guiding pin K into one of the holes in dial J.
11. Adjust assembly as instructed on page 11.

REMOVALS AND REPLACEMENTS

HAND WHEEL AND COUNTERBALANCE

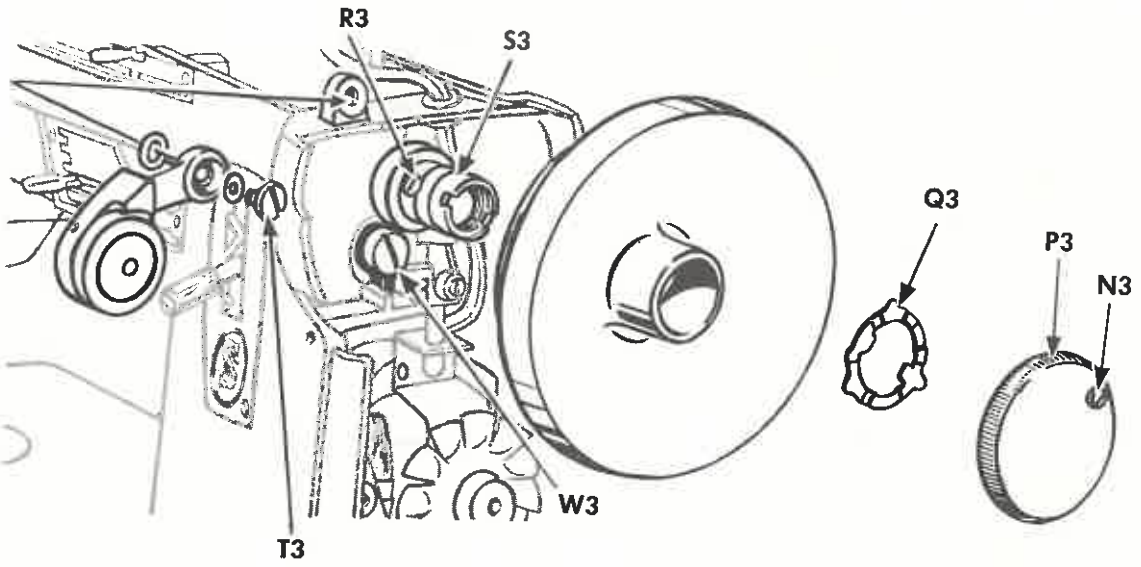


Fig. 37. Hand Wheel and Bobbin Winder Assembly

REMOVAL:

1. Remove motor cover plate and disengage belt from motor pulley as instructed on page 17.
2. Remove screw N3 from stop motion screw P3.
3. Remove screw P3, washer Q3 and hand wheel from arm shaft.
4. Remove screw R3 and counterbalance S3 from arm shaft.

REPLACEMENT:

1. Replace counterbalance S3 and insert screw R3 through counterbalance and into hole provided for it, as shown above.
2. Replace hand wheel with motor belt in groove of hand wheel.
3. Place belt around motor pulley.
4. Replace stop motion clamp washer Q3.
5. Replace and tighten stop motion screw P3 and replace screw N3 in hole of stop motion screw P3.

NOTE: If stitching mechanism is not released when stop motion screw P3 is loosened, remove screws N3 and P3. Remove washer Q3, rotate it 180° and replace it on arm shaft. Replace screws N3 and P3.

BOBBIN WINDER

REMOVAL:

1. Remove hand wheel assembly as instructed above. (It is not necessary to remove the counter-balance).
2. Remove screw T3 and remove bobbin winder assembly in order shown in Fig. 37.

REPLACEMENT:

1. Replace bobbin winder in reverse order of its removal.
2. Replace hand wheel assembly as instructed above.

REMOVALS AND REPLACEMENTS

STITCH LENGTH REGULATOR

Machine 328K

REMOVAL: (See Fig. 38)

1. Remove hand wheel as instructed on page 21. (It is not necessary to remove the counterbalance.)
2. Remove screws U3 which fasten stitch length indicator plate to machine arm.
3. Move regulator lever V3 to lowest position.
4. Remove large hinge screw W3, Fig. 37, (page 21) with its washer and spring, from arm casting.
5. Pull entire regulator, with indicator plate, out of machine arm.

REPLACEMENT:

1. Install regulator in arm, making certain that regulator fits on slide block of feed forked connection, as shown in Fig. 38.
2. Replace large hinge screw W3, Fig. 37, (page 21) with its washer and spring, through arm casting and into regulator.

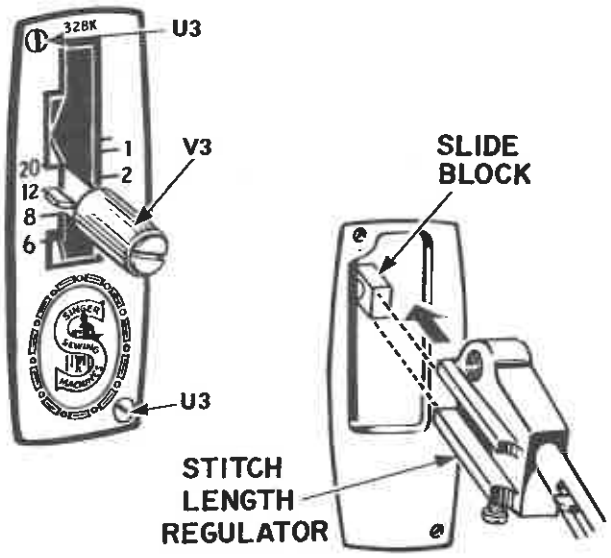


Fig. 38. Stitch Length Regulator

3. Position indicator plate and fasten to arm with screws U3.
4. Replace hand wheel as instructed on page 21.

STITCH LENGTH REGULATOR

Machine 327K

REMOVAL: (See Fig. 39)

1. Remove hand wheel as instructed on page 21.
(It is not necessary to remove the counterbalance.)
2. Remove screw U3 which fasten stitch length indicator plate to machine arm.
3. Move regulator lever Q5 to lowest position.
4. Remove large hinge screw W3, Fig. 37, (Page 21) with its washer and spring, from arm casting.
5. Pull entire regulator, with indicator plate, out of machine arm.

REPLACEMENT:

1. Install regulator in arm, making certain that regulator fits on slide block of feed forked connection, as shown in Fig. 39.
2. Replace large hinge screw W3, Fig. 37, (Page 21) with its washer and spring through arm casting and into regulator.

3. Position indicator plate and fasten to arm with screws U3.
4. Replace hand wheel as instructed on page 21.

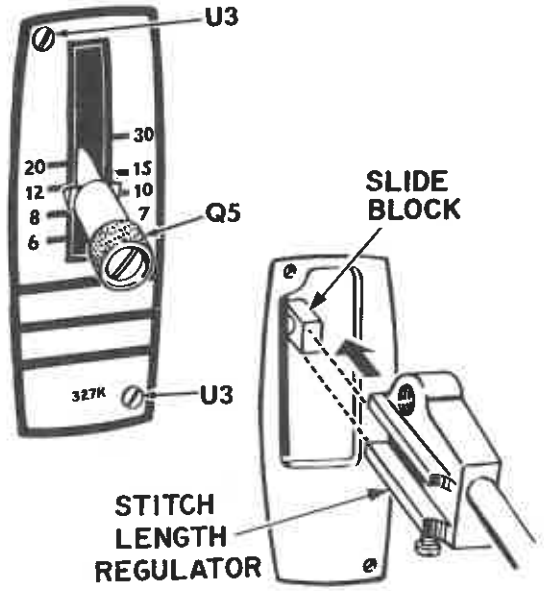


Fig. 39. Stitch Length Regulator

REMOVALS AND REPLACEMENTS

FEED LIFTING ROCK SHAFT

REMOVAL: (See Fig. 40)

1. Remove bottom cover plate.
2. Remove snap ring A4, loosen screw C and remove eccentric stud D disengaging feed lifting rock shaft M from upright connecting rod.
3. Loosen set screw N and remove screw center P.
4. Remove feed lifting rock shaft M.

REPLACEMENT:

1. Install feed lifting rock shaft M in reverse order of its removal.
2. Adjust feed dog as instructed on pages 7 and 8.

FEED ROCK SHAFT ASSEMBLY

REMOVAL: (See Fig. 40)

1. Remove throat plate and feed dog.
2. Remove bottom cover plate.
3. Remove feed lifting rock shaft M as instructed above.
4. Loosen screw E and remove eccentric stud F disengaging feed rock shaft L from feed forked connection.
5. Loosen screw G and remove screw center J.
6. Remove feed rock shaft L with feed bar assembly.

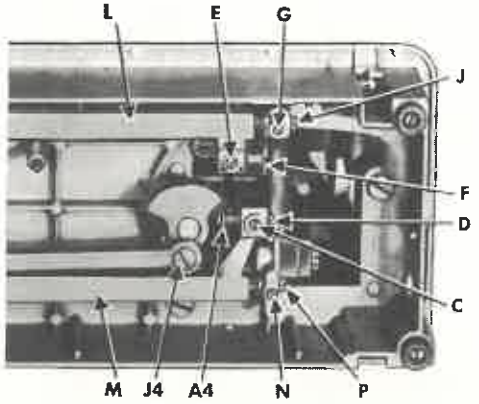


Fig. 40. Feed Lifting Rock Shaft and Feed Rock Shaft Assembly

REPLACEMENT:

1. Install feed rock shaft L (with feed bar assembly) in reverse order of its removal.
2. Install feed lifting rock shaft as instructed above.
3. Replace feed dog on feed bar.
4. Adjust feed dog as instructed on pages 7 and 8.

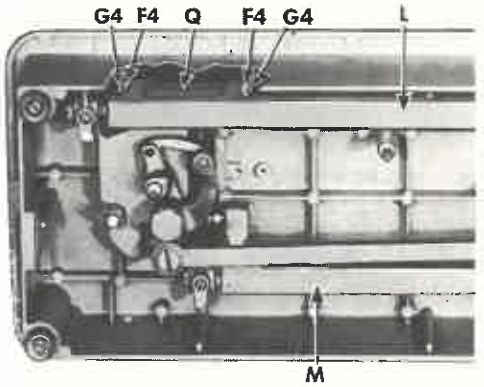


Fig. 41. Feed Bar Assembly

FEED BAR ASSEMBLY

REMOVAL: (See Fig. 41)

1. Remove feed lifting rock shaft M and feed rock shaft L as instructed above.
2. Loosen nuts F4 and screw centers G4 and remove feed bar Q from feed rock shaft L.

REPLACEMENT AND ADJUSTMENT:

1. Install feed bar Q in reverse order of its removal. Tighten screw centers G4 equally upon feed bar Q so that feed bar rides freely on feed rock shaft L without any end play or binding. Then, while maintaining settings of screw centers G4, tighten nuts F4.
2. Install feed rock shaft assembly as instructed above.
3. Install feed lifting rock shaft as instructed above.
4. Replace feed dog and adjust as instructed on pages 7 and 8.
5. Replace throat plate and bottom cover plate.

REMOVALS AND REPLACEMENTS

OSCILLATING HOOK AND BELL CRANK ASSEMBLY

REMOVAL:

1. Remove bottom cover plate, needle, presser foot, throat plate, bed slide, bobbin case and feed dog.
2. Remove hinge screw J4, Figs. 40 and 42, by turning screws clockwise, and remove pitman rod H4.
3. Loosen set screw U, Fig. 34.
4. Remove large hexagon head hinge screw K4 and remove bell crank assembly L4 as a unit.
5. Remove hexagon nut V.
6. Remove oscillating hook, complete with position finger and cushion spring assembly.

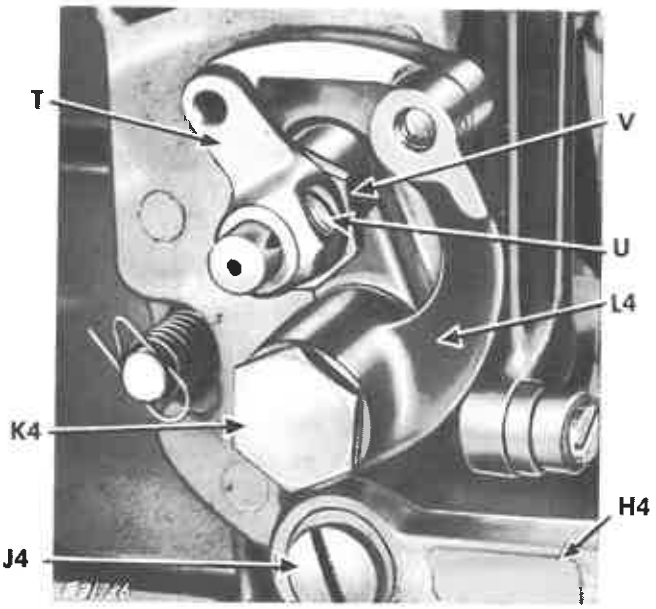


Fig. 42. Oscillating Hook Crank Assembly

REPLACEMENT:

1. Replace oscillating hook assembly Q4, Fig. 43, making certain that pilot of bracket screw is aligned with hole provided for it in bed casting, as shown by dotted lines in Fig. 43.
2. Replace hexagon nut V, Fig. 42 and tighten firmly against bed casting.
3. Replace bell crank assembly L4 and securely tighten hexagon head hinge screw K4.
4. Align set screw U with timing groove of hook shaft; then, while pressing upon hook from top of machine, set crank T firmly against nut V and securely tighten screw U.
5. Replace pitman rod H4 and securely tighten its two hinge screws J4, Figs. 40 and 42.
6. Replace bottom cover plate, feed dog, bobbin case, bed slide, throat plate, presser foot and needle.

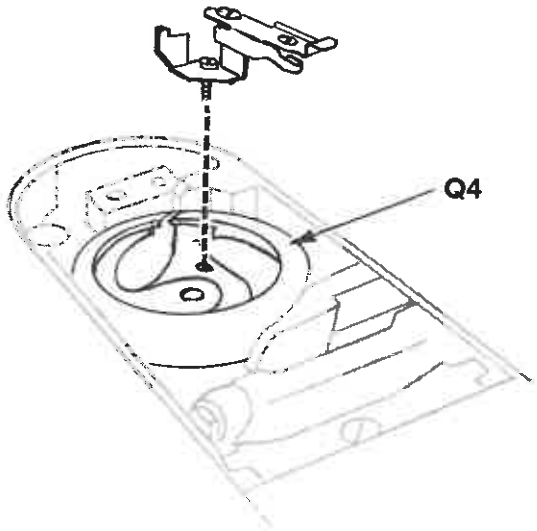


Fig. 43. Replacing Hook

REMOVALS AND REPLACEMENTS

FEED LIFTING ROCK SHAFT CONNECTING ROD

REMOVAL:

1. Remove arm top cover and bed cover plate.
2. Remove cap screws A2, Fig. 44 and remove connecting rod cap.
3. Tilt machine back. Remove snap ring A4, Fig. 45 loosen set screw C and remove eccentric stud D, disengaging connecting rod from feed lifting rock shaft.
4. Remove connecting rod from bottom of machine.

REPLACEMENT:

1. Insert connecting rod into upright arm from bottom of machine, so that it fits around bottom half of gear hub C2, Fig. 44.
2. Replace cap over top half of gear hub and fasten cap to rod with two screws A2.
3. Replace eccentric stud D, Fig. 45 and snap ring A4, engaging connecting rod with feed lifting rock shaft.
4. Adjust feed dog height as instructed on page 7.
5. Replace arm top cover and bed cover plate.

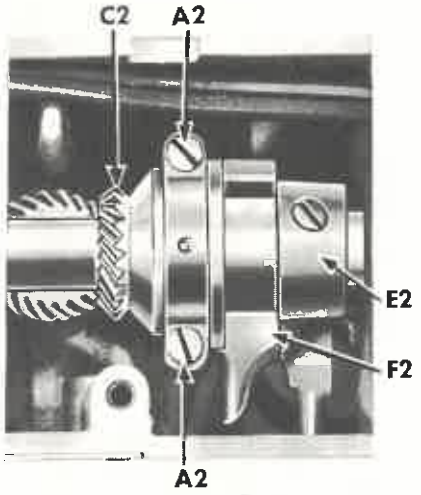


Fig. 44. Feed Lifting Rock Shaft Connecting Rod and Feed Forked Connection

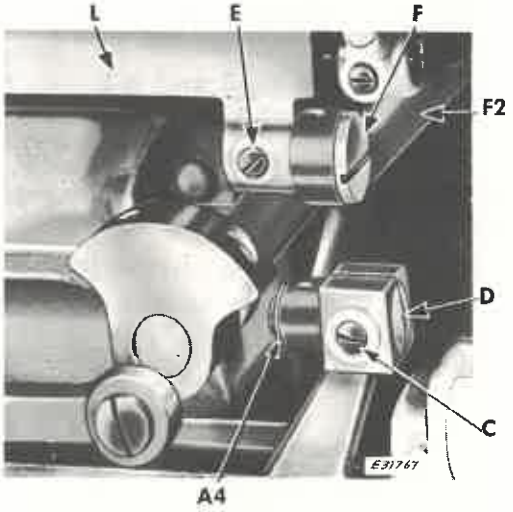


Fig. 45. Connections Beneath Machine Bed

FEED FORKED CONNECTION

REMOVAL:

1. Remove arm top cover and bed cover plate.
2. Remove stitch length regulator as instructed on page 22.
3. Loosen set screw E, Fig. 45 and remove eccentric stud F, disengaging feed forked connection F2 from feed rock shaft L.
4. Remove feed forked connection F2 from upright arm, through bottom of machine.

REPLACEMENT:

1. Insert feed forked connection F2 into upright arm, from bottom of machine, so that it fits around feed eccentric E2 as shown in Fig. 44.
2. Replace eccentric stud F, engaging feed forked connection with feed rock shaft.
3. Replace stitch length regulator as instructed on page 22.
4. Set feed dog lengthwise as instructed on page 7.
5. Replace arm top cover and bed cover plate.

REMOVALS AND REPLACEMENTS

NEEDLE BAR

REMOVAL: (See Fig. 46)

1. Remove arm top cover and face plate.
2. Remove needle clamp.
3. Loosen screw R and lift needle bar out of machine.

REPLACEMENT:

1. Insert needle bar down through needle bar frame as shown below.
2. Adjust needle bar height as instructed on page 12.
3. Securely tighten screw R.
4. Replace needle clamp, arm top cover and face plate.

NEEDLE BAR ROCKER BRACKET ASSEMBLY

REMOVAL: (See Fig. 46)

1. Remove needle and face plate.
2. Loosen set screw P4 and remove hinge pin Q4
3. Loosen set screws J2 and K2.
4. Loosen set screw L2 in collar M2 and remove eccentric stud N2.
5. Remove needle bar frame R2 together with needle bar.
6. Then loosen clamping screw R and remove needle bar from needle bar frame R2.

REPLACEMENT:

1. Replace needle bar frame in reverse order of its removal.

NOTE: Before replacing eccentric stud N2 make certain that spacing washer S4 is in place as shown in Fig. 46.

2. Set needle bar at correct height as instructed on page 12.
3. Adjust needle to or from hook point as instructed on page 29. Recheck hook timing.

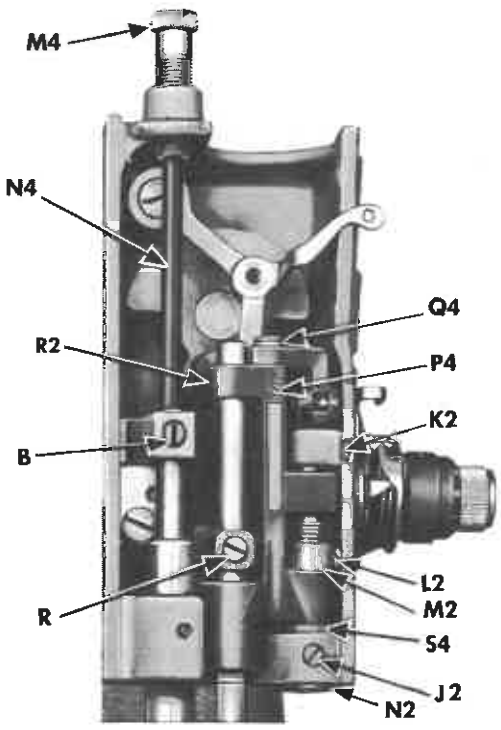


Fig. 46. Needle Bar, Rocker Bracket, and Presser Bar Assembly

PRESSER BAR

REMOVAL: (See Fig. 46)

1. Remove face plate, presser foot and thumb screw.
2. Remove pressure regulating thumb screw M4.
3. Remove extension pin N4 with spring from top of machine.
4. Loosen screw B and remove presser bar from machine.

REPLACEMENT:

1. Replace presser bar assembly in the reverse order of its removal.
2. Replace presser foot on presser bar.
3. Adjust presser foot at correct height and align foot with slots for feed dog in throat plate, as instructed on page 6.
4. Then securely tighten screw B.

REMOVALS AND REPLACEMENTS

THREAD TAKE-UP LEVER ASSEMBLY

REMOVAL: (See Fig. 47)

1. Remove arm top cover and face plate.
2. Remove needle bar and presser bar (Steps 1, 2 and 3 only) as instructed on page 26.
3. Remove needle bar rocker bracket assembly as instructed on page 26.
4. Loosen set screw A.
5. Through hole in top of casting, loosen set screw B in needle bar crank C.
6. Withdraw thread take-up lever D, with link E, hinge stud F and connecting link G from machine.

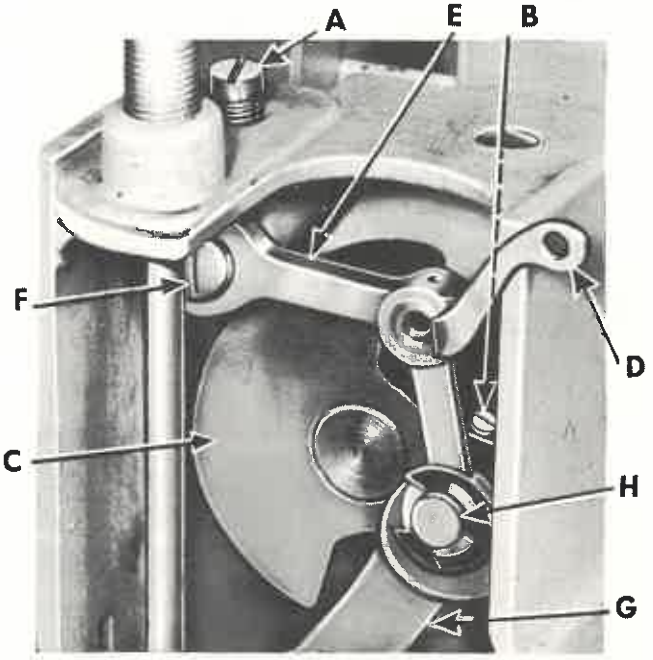


Fig. 47. Thread Take-up Lever Assembly

REPLACEMENT:

1 Replace thread take-up lever assembly in reverse order of its removal.

IMPORTANT: When replacing take-up lever assembly, make certain that set screw B is tightened firmly against "flat" of take-up lever hinge stud H. Then, while turning hand wheel over toward you, slowly tighten set screw A.

2. Replace needle bar rocker bracket assembly and time needle vibrating mechanism as instructed on pages 26, 29, 30 and 31.
3. Replace presser bar extension pin with its spring. Replace pressure regulating thumb screw.
4. Replace needle bar and adjust to correct height as instructed on page 12.
5. Replace arm top cover and face plate.

REMOVALS AND REPLACEMENTS
HORIZONTAL ARM SHAFT

REMOVAL: (See Fig. 48)

1. Remove arm top cover and face plate.
2. Remove needle bar and presser bar (Steps 1, 2 and 3 only) as instructed on page 26.
3. Remove needle bar rocker bracket assembly as instructed on page 26.
4. Remove thread take-up lever assembly as instructed on page 27.
5. Remove hand wheel and counterbalance assembly as instructed on page 21.
6. Loosen screw Y in collar Z.
7. Remove screws A2 and remove connecting rod cap.
8. Loosen screws S2 in arm shaft worm gear T2.
9. Loosen timing screws B2 and D2 so that gear C2 and eccentric E2 are free on arm shaft.

NOTE: Keep gears in mesh at all times.

10. Remove arm shaft out of face plate-end of machine. Hold gear C2 in mesh with gear at top of upright shaft.

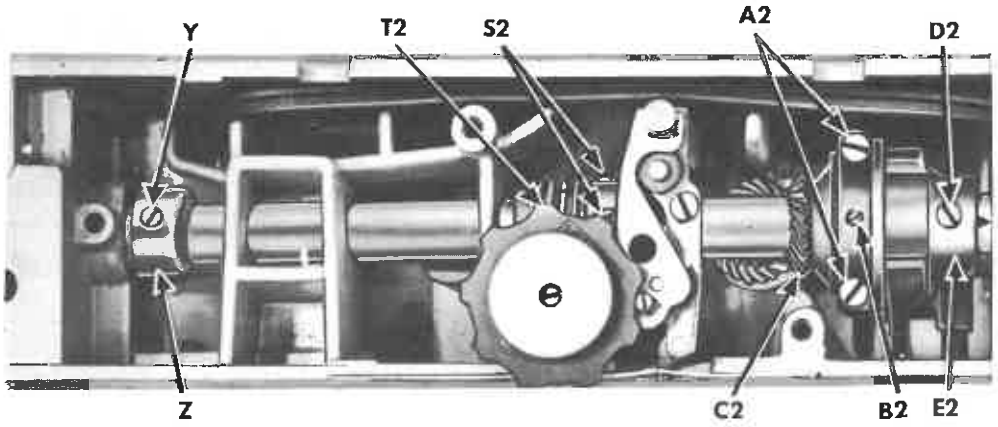


Fig. 48. Horizontal Arm Shaft.

REPLACEMENT:

1. From face plate-end of machine, insert new arm shaft into machine arm, through collar Z, worm gear T2, bevel gear C2 and feed eccentric E2.
2. Make certain that flat on arm shaft is under set screw Y, then, while pressing firmly on needle bar crank and holding collar Z against casting, tighten set screw Y.
3. Set gear C2 firmly in mesh with gear at top of upright shaft and tighten screw B2 against timing groove of arm shaft.
4. Set feed eccentric E2 gently against feed forked connection and tighten screw D2 against timing groove of arm shaft.
5. Replace connecting rod cap and fasten with screws A2.
6. Replace counterbalance and hand wheel assembly as instructed on page 21.
7. Replace thread take-up lever assembly as instructed on page 27.
8. Replace needle bar rocker bracket assembly and cam stack assembly as instructed on pages 26 and 37.
9. Replace needle bar and presser bar assembly as instructed on page 26.
10. Time needle bar vibrating mechanism as instructed on pages 26, 29, 30 and 31.
11. Replace arm top cover and face plate.

TO SET THE POSITION OF THE NEEDLE TO OR FROM THE HOOK POINT

PREPARATION:

1. Set needle bar at correct height as instructed on page 12.
2. Set needle position lever at "C"† and stitch width lever at "O".
3. Remove presser foot, throat plate, bobbin case and feed dog.
4. Insert a size #18 needle into needle clamp.

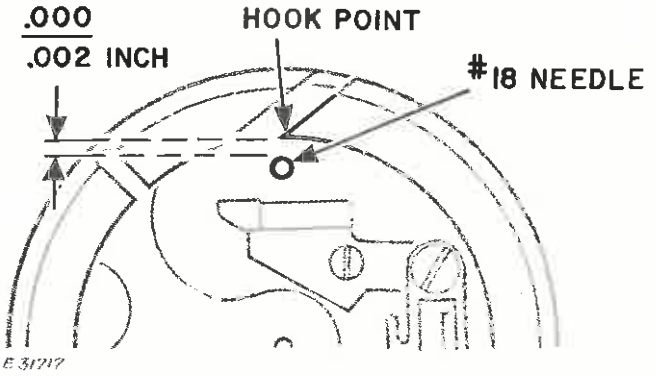


Fig. 49. Correct Position of Needle (Viewed from Above)

CHECK:

Turn hand wheel over toward you until point of hook is directly behind needle. Distance between needle and hook point should be .000 to .002 inch, as shown in Fig. 49. (Use Feeler Gauge to check this distance.)

SETTING:

1. Loosen screws J2 and K2, Fig. 50.
2. Loosen set screw L2 in collar M2.
3. Using offset screwdriver, turn eccentric stud N2 left or right, as required, to bring needle .000 and .002 inch from point of hook.
4. When correct setting is obtained (.000 to .002 inch), tighten screws J2 and K2.
5. Turn collar M2 counterclockwise until sufficient spring tension is obtained. Then tighten collar set screw L2.

† Applies only to Machine 328K

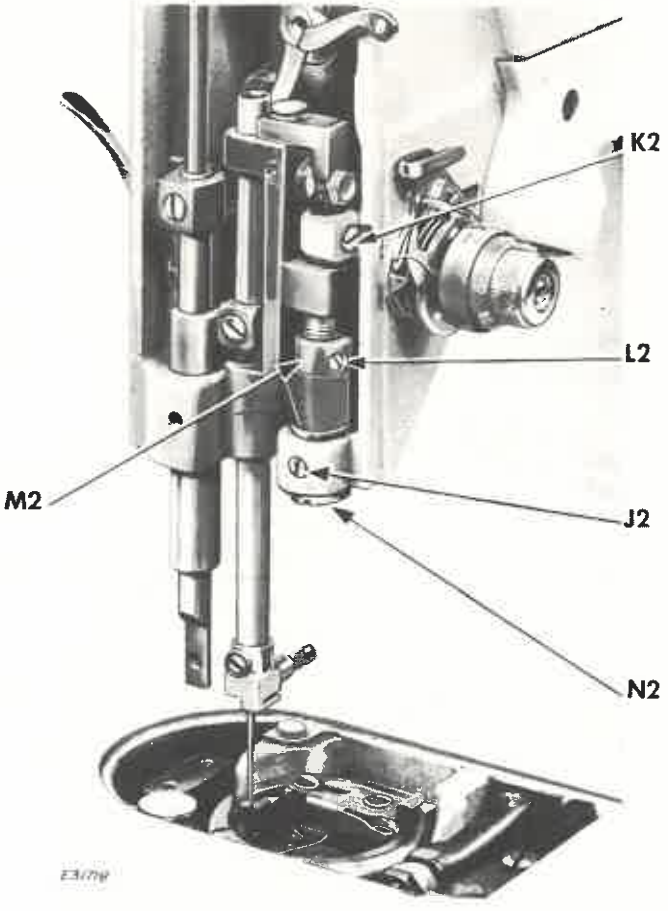


Fig. 50. Setting Position of Needle to or from Hook Point

TO CENTRALIZE THE NEEDLE IN NEEDLE HOLE IN STRAIGHT-STITCHING THROAT PLATE

PREPARATION:

1. Remove presser foot, arm top cover, face plate and lamp cover.
2. Install straight-stitching throat plate.
3. Insert a size #11 needle up into needle clamp.
4. Place Disc No. 1 (Zigzag) on disc spindle.†
5. Set needle position selector at "C"† and stitch width lever at "O".

CHECK:

Turn hand wheel over toward you until point of needle enters hole of throat plate. Point of needle (Size #11) should be located in center of needle hole.

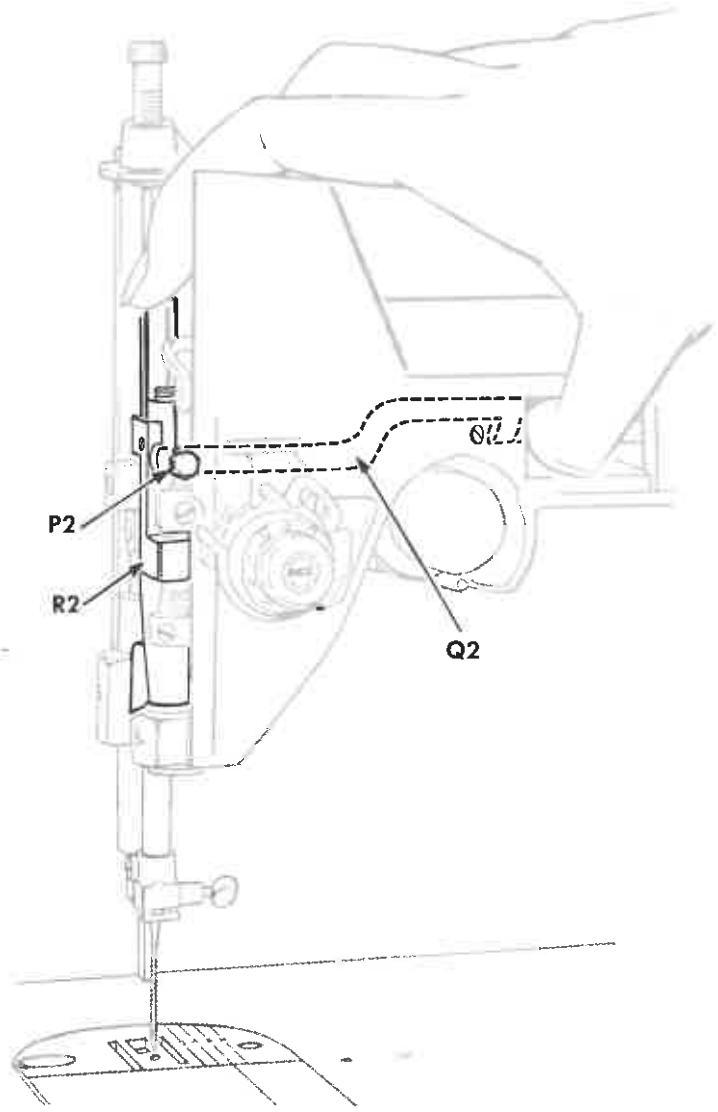


Fig. 51. Centralizing Needle.

SETTING: (See Fig. 51.)

1. Loosen hexagon screw P2 (Use 1/4 inch wrench).
2. With thumb of right hand, press driving arm Q2 firmly toward face plate end of machine, and at same time, press needle bar rocker bracket assembly R2 toward hand wheel end until point of needle is located directly at center of throat plate needle hole.
3. When correct needle position is obtained securely tighten hexagon screw P2.
4. Replace presser foot, arm top cover, face plate and lamp cover.

† Applies only to Machine 328K

TO TIME THE PENDULUM MOVEMENT OF THE NEEDLE BAR

Machine 328K

PREPARATION:

1. Remove arm top cover.
2. Insert general purpose throat plate.
3. Place Disc No. 1 (Zigzag) on disc spindle.
4. Set needle position selector at "C" and stitch width lever at "4".

CHECK:

While slowly turning hand wheel over toward you, observe movement of needle bar.

Needle should begin and end its pendulum movement at about same height above throat plate, as shown in Fig. 52. Needle should reach its peak of ascent midway between two extreme positions of needle.

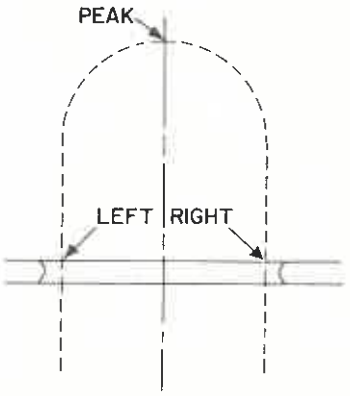


Fig. 52. Correct Pendulum Movement

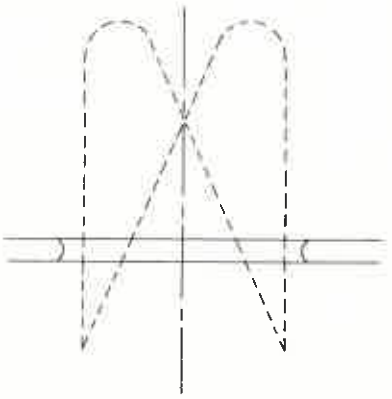


Fig. 53. Incorrect Pendulum Movement

SETTING:

1. Centralize needle in needle hole of straight-stitching throat plate as instructed on page 30
2. Set needle position selector at "L" as shown in Fig. 54.
3. Loosen two set screws S2 in worm gear T2, Fig. 55.
4. Turn hand wheel over toward you until needle bar is at its lowest point in LEFT position.
5. Turn disc as required to locate follower U2 at center of low point of Zigzag disc as shown in Fig. 55.
6. Tighten one of set screws S2.
   NOTE: If set screws S2 can not be reached, turn worm gear T2 until a set screw becomes accessible.
7. Re-check pendulum movement. If satisfactory, tighten other set screw S2.
8. Replace arm top cover.

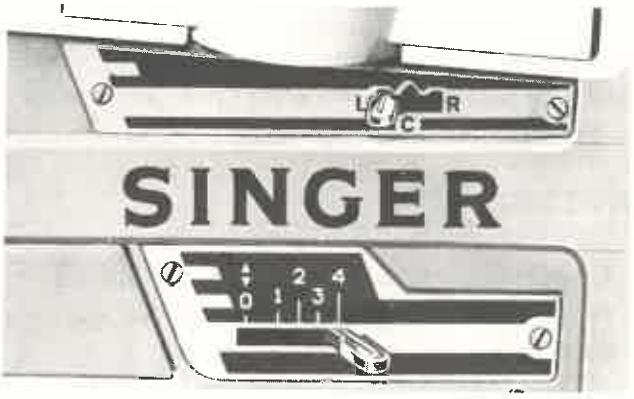


Fig. 54. Needle Position and Stitch Width Selectors.

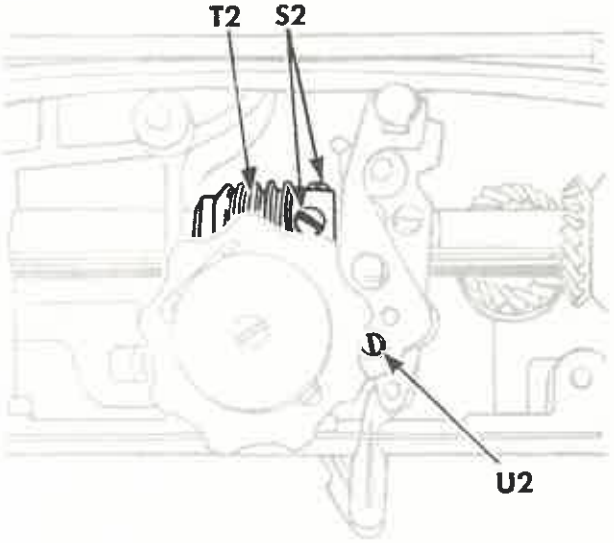


Fig. 55. Adjustment for Correct Pendulum Movement.

TO TIME THE PENDULUM MOVEMENT OF THE NEEDLE BAR

Machine 327K

PREPARATION:

1. Remove arm top cover.

2. Insert general purpose throat plate.

3. Set stitch width lever at "4".

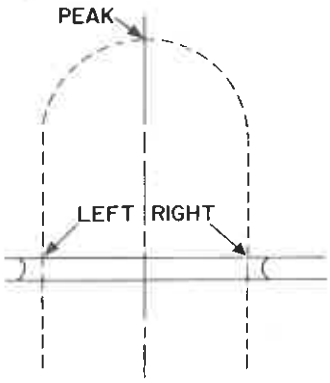


Fig. 56. Correct Pendulum Movement

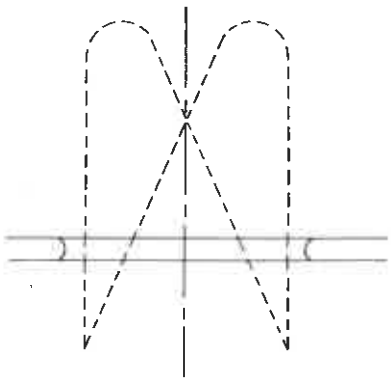


Fig. 57. Incorrect Pendulum Movement

CHECK:

While slowly turning hand wheel over toward you, observe movement of needle bar.

Needle should begin and end its pendulum movement at about same height above throat plate, as shown in Fig. 56.

Needle should reach its peak of ascent midway between two extreme positions of needle.

Fig. 58. Stitch Width Selector

SETTING:

1. Centralize needle in needle hole of straight stitching throat plate as instructed on page 30.

2. Loosen two set screws S2 in worm gear T2, Fig. 59.

3. Turn hand wheel over toward you until needle bar is at its lowest point.

4. Turn disc as required to locate follower U2 at center of low point of Zigzag Disc as shown in Fig. 59.

5. Tighten one of set screws S2.
NOTE: If set screws S2 can not be reached, turn worm gear T2 until a set screw becomes accessible.

6. Re-check pendulum movement. If satisfactory, tighten other set screw S2.

7. Replace arm top cover.

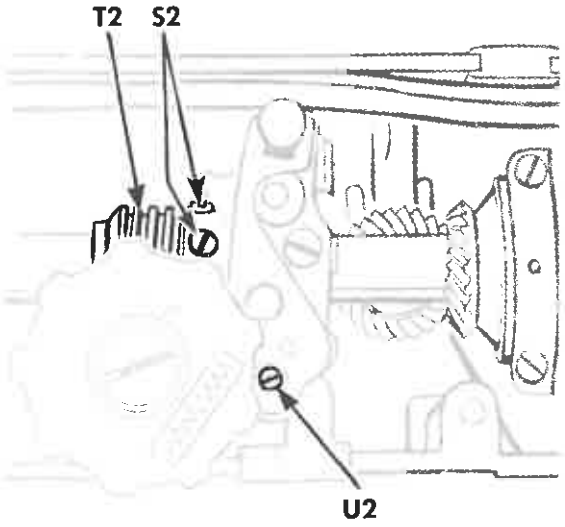


Fig. 59. Adjustment for Correct Pendulum Movement

TO ADJUST NEEDLE POSITION SELECTOR BRACKET ASSEMBLY

Machine 328K

PREPARATION:

1. Remove arm top cover.
2. Insert general purpose throat plate.
3. Insert a size #9 needle up into needle clamp.
4. Place Disc No. 1 (Zigzag) on disc spindle.
5. Set needle position selector at "L".
6. Turn hand wheel over toward you until needle bar is at its lowest point in LEFT position.

CHECK:

Move stitch width lever from left to right. While doing so, there should be minimum movement in needle bar.

SETTING: (See Fig. 60)

1. Set stitch width lever at "4".
2. Loosen bracket screw V2.
3. Turn hand wheel over toward you until needle bar is at its lowest point in LEFT position.
4. Move stitch width lever slowly from "1" to "4" and, at same time, move selector bracket extension W2 toward left or right as required, until there is minimum movement in needle bar.
5. Tighten bracket screw V2.

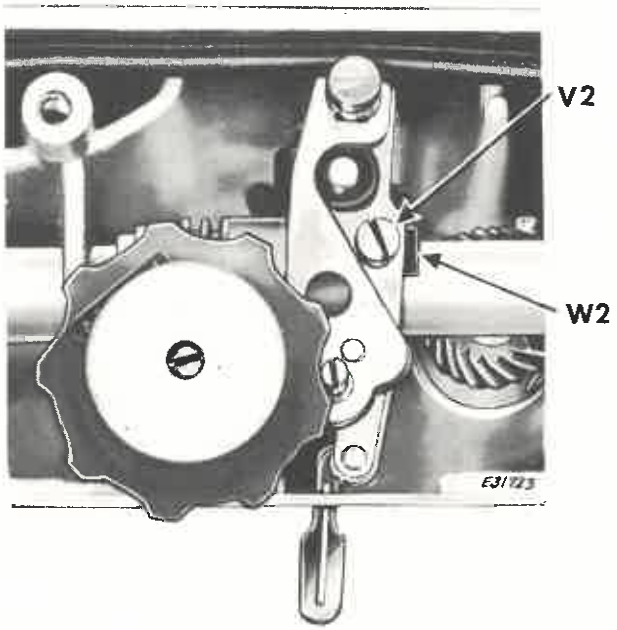


Fig. 60. Adjusting Needle Position Selector Bracket

CHECK:

Place a sheet of note paper over throat plate. Set stitch width lever at "4" and needle position selector at "L". With needle in LEFT position, lower and raise needle to make a slight perforation in the paper. Repeat this operation at setting of "O", with needle remaining in LEFT position.

At correct adjustment of selector bracket W2, the needle will always enter the same perforation in paper at "O" and "4" setting.

TO ADJUST NEEDLE POSITION SELECTOR BRACKET ASSEMBLY

Machine 327K

PREPARATION:

1. Remove arm top cover.

2. Insert general purpose throat plate.

3. Insert a size #9 needle up into needle clamp.

4. Remove Disc No. 1 (Zigzag) and replace with DISC NO. 6 DOMINO. To remove disc, pry under disc retaining ring with a small screwdriver.

5. Turn hand wheel over toward you until needle bar is at its lowest point.

CHECK:

Move stitch width lever from left to right. While doing so, there should be minimum movement in needle bar.

SETTING: (See Fig. 61)

1. Set stitch width lever at "4".

2. Loosen bracket screw V2.

3. Turn hand wheel over toward you until disc follower is at low portion of DISC NO. 6 (next to stitch pattern block) with needle bar at its lowest point, in center needle position.

4. Move stitch width lever slowly from "1" to "4" and at same time, move selector bracket extension W2 toward left or right as required, until there is minimum movement in needle bar.

5. Tighten bracket screw V2.

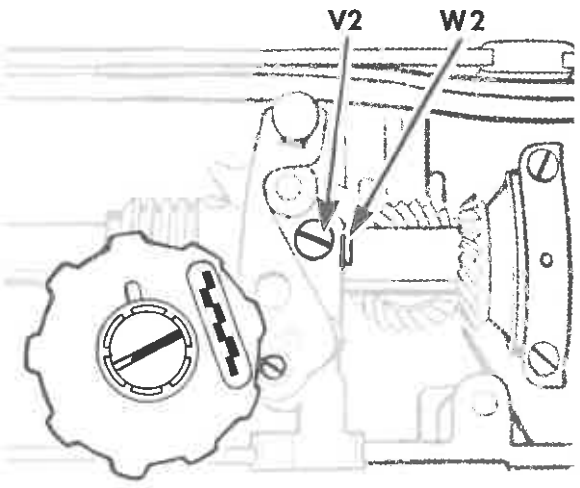


Fig. 61. Adjusting Needle Position Selector Bracket

CHECK:

Place a sheet of paper over throat plate. Set stitch width lever at "4". Lower and raise needle to make a slight perforation in the paper. Repeat this operation at setting of "O".

At correct adjustment of selector bracket W2, the needle will always enter the same perforation in paper at "O" and "4" setting.

TO ADJUST THE CAM STACK

Machine 328K

PREPARATION:

1. Remove arm top cover.
2. Set needle position selector at "C" and stitch width lever at "O".

CHECK:

Check for excessive end play or binding between arm shaft worm gear T2 and disc driving gear Y2.

SETTING:

1. Remove stitch width indicator plate.
2. Loosen cam stack set screw Z2.
3. Insert screwdriver in slot of disc spindle A3 and turn spindle counter-clockwise to bring high point of eccentric toward arm shaft worm gear. Then "back-off" until there is no binding and a minimum amount of backlash.
4. Tighten set screw Z2.
5. Replace stitch width indicator plate.

IMPORTANT: Adjust stitch width lever for maximum width of zigzag stitch as follows:

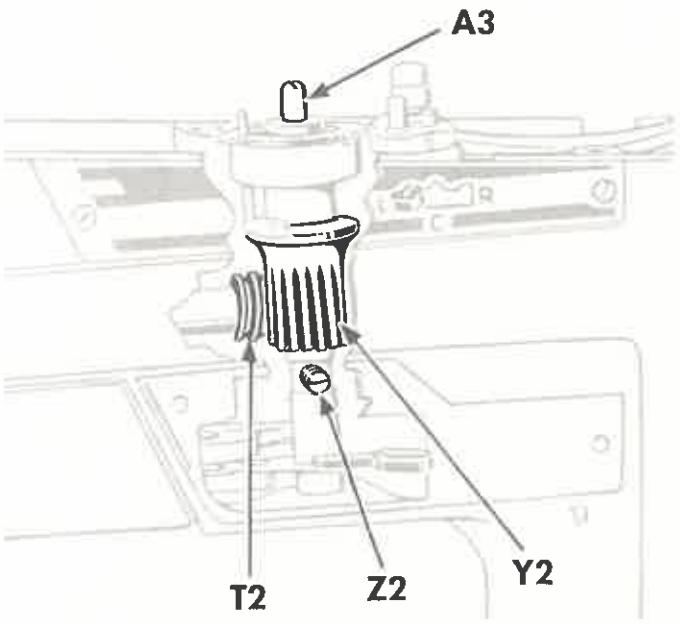


Fig. 62. Cam Stack Adjustment

(1) Set stitch width lever at "4".
(2) Loosen screw stud B3, Fig. 63.
(3) Press needle bar driving arm Q2 toward you (away from arm shaft) and at same time tighten screw stud B3.

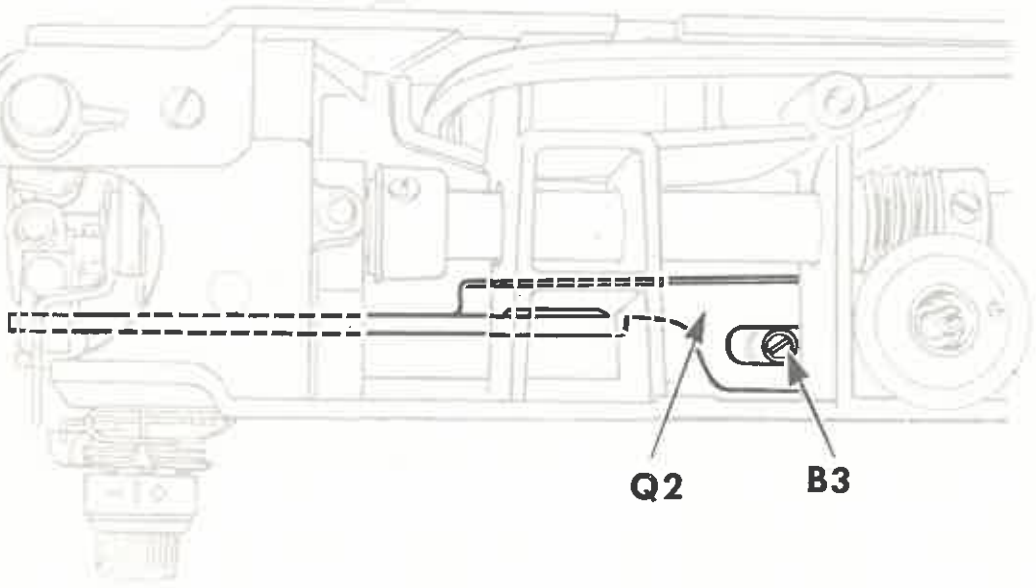


Fig. 63. Stitch Width Lever Adjustment.

TO ADJUST THE CAM STACK

Machine 327K

PREPARATION:

1. Remove arm top cover.
2. Set stitch width lever at "O".

CHECK:

Check for excessive end play or binding between arm shaft worm gear T2 and disc driving gear Y2.

SETTING:

1. Remove stitch width indicator plate.
2. Loosen cam stack set screw Z2.
3. Insert screwdriver in slot of disc spindle A3 and turn spindle counterclockwise to bring high point of eccentric toward arm shaft worm gear. Then "back-off" until there is no binding and a minimum amount of backlash.
4. Tighten set screw Z2.

   NOTE: Make one complete turn of cam stack to check for binding between the two gears.

5. Replace stitch width indicator plate.

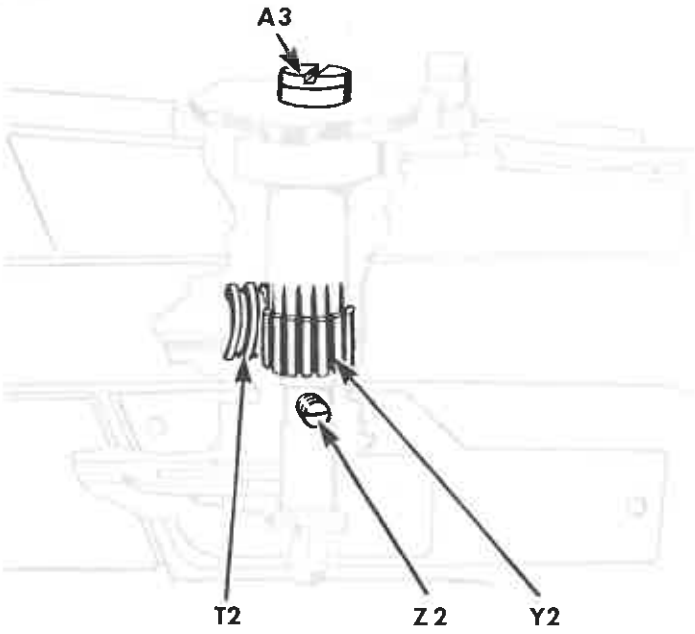


Fig. 64. Cam Stack Adjustment

IMPORTANT:

Adjust stitch width lever for maximum width of zigzag stitch as follows:

1. Set stitch width lever at "4".
2. Loosen screw stud B3, Fig. 65.
3. Press needle bar driving arm Q2 toward you (away from arm shaft) and at same time tighten screw stud B3.

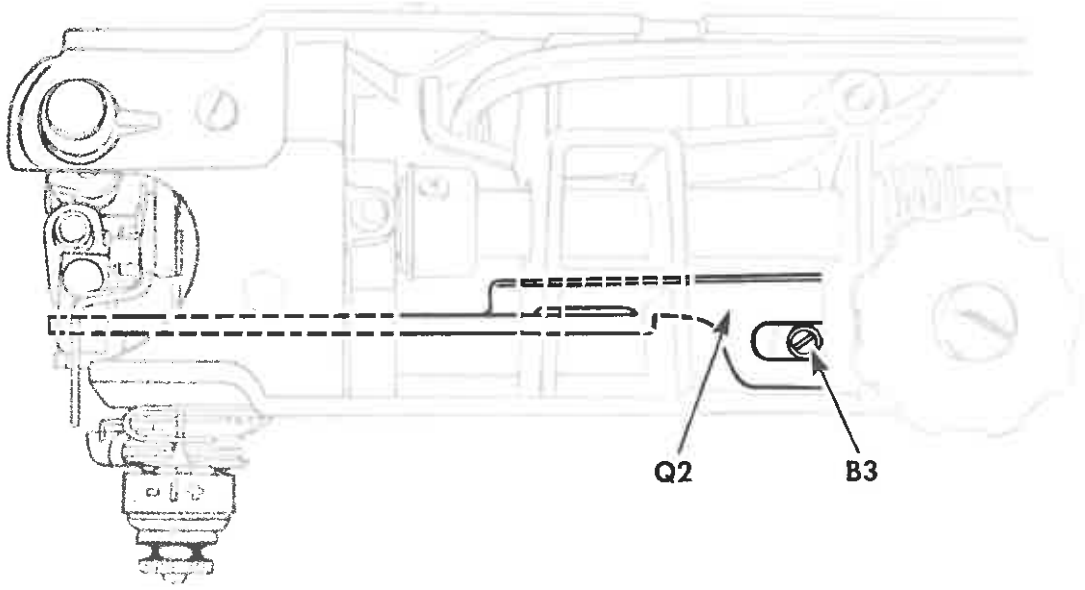


Fig. 65. Stitch Width Lever Adjustment.

REMOVALS AND REPLACEMENTS

CAM STACK AND STITCH WIDTH LEVER ASSEMBLY

Machine 327K

REMOVALS: (See Fig. 66)

1. Remove arm top.
2. Remove stitch width indicator plate.
3. Loosen set screw Z2.
4. Remove screw stud Y3.
5. Lift entire cam stack assembly from machine arm.
6. Slide stitch width lever X3 from fork of driving arm Q2 and remove lever assembly from machine.

REPLACEMENTS:

1. Replace cam stack assembly in machine arm.
2. Insert stitch width lever assembly into cut-out in front of arm and fit stud W3 in fork of driving arm Q2, as shown in Fig. 66.
3. Align hole in lever spring with cam stack shaft and, from bottom of arm, replace screw stud Y3. Make certain that lever assembly is properly seated on shaft, then securely tighten screw stud Y3.

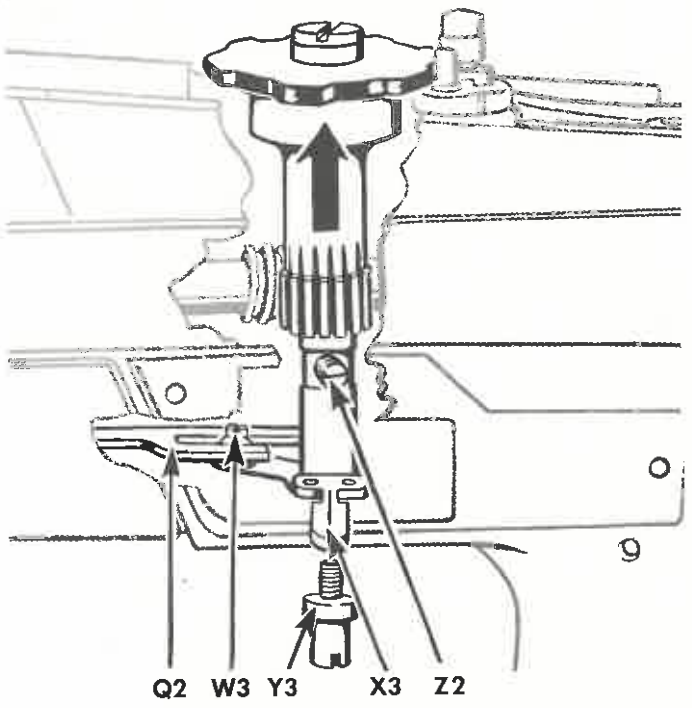


Fig. 66. Cam Stack and Stitch Width Lever Assembly

CAM STACK AND STITCH WIDTH LEVER ASSEMBLY

Machine 328K

REMOVAL: (See Fig. 67)

1. Remove arm top cover.
2. Remove stitch width indicator plate.
3. Loosen set screw Z2.
4. Remove screw stud Y3.
5. Lift entire cam stack assembly from machine arm.
6. Slide stitch width lever X3 from fork of driving arm Q2 and remove lever assembly from machine arm.

REPLACEMENTS:

1. Replace cam stack assembly in machine arm.
2. Insert stitch width lever assembly into cutout in front of arm and fit stud W3 in fork of driving arm Q2, as shown in Fig. 67.
3. Align hole in lever spring with cam stack shaft and, from bottom of arm, replace screw stud Y3. Make certain that lever assembly is properly seated on shaft, then securely tighten screw stud Y3.

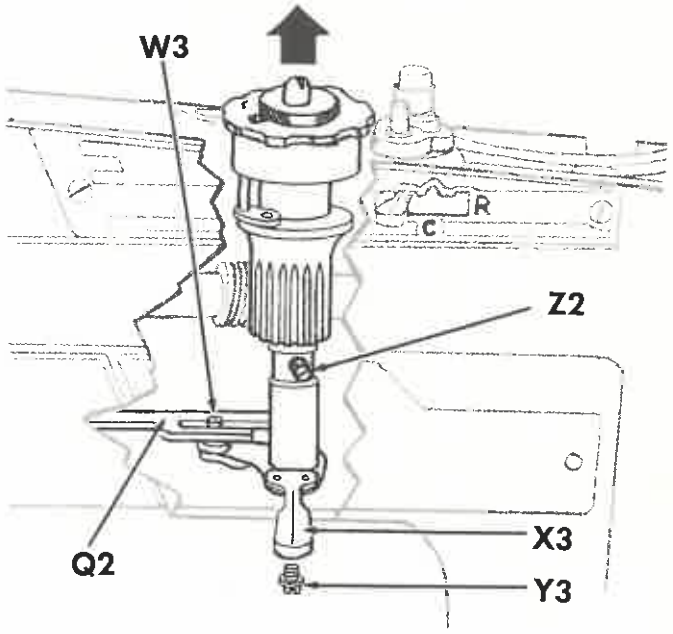


Fig. 67. Cam Stack and Stitch Width Lever Assembly

NEEDLE POSITION SELECTOR LEVER ASSEMBLY AND NEEDLE BAR DRIVING ARM

REMOVAL:

1. Remove arm top cover.
2. Remove needle position and stitch width indicator plate.
3. Remove cam stack assembly as instructed on page 37.
4. Remove screw A5, Fig. 68 and slide needle position lever B5 with its spring, toward right and out of machine.
5. Lift out hinge pin C5, disengaging bracket D5 from pin E5.
6. Loosen set screw F5, Fig. 69 and remove hinge pin G5, disengaging block H5 from needle bar rocker assembly.

NOTE: It is not necessary to remove hexagon head screw J5 from driving arm.

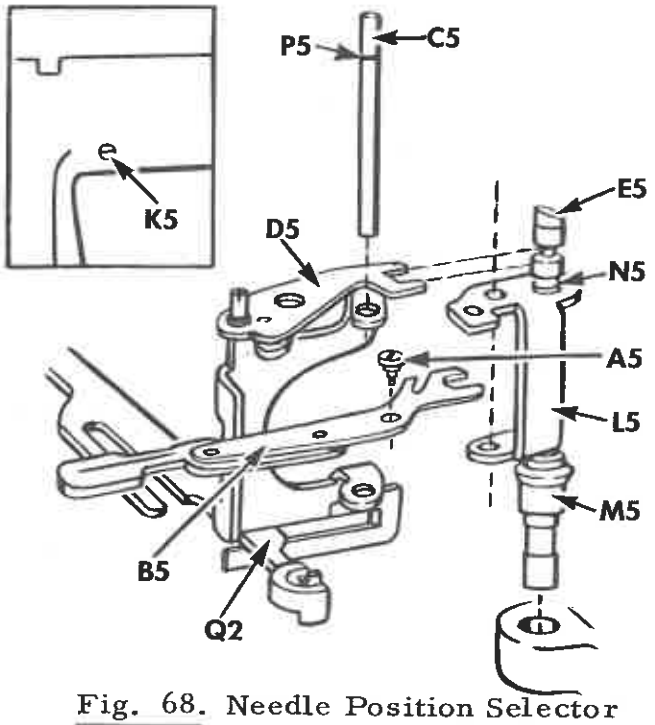


Fig. 68. Needle Position Selector Lever and Bracket Assembly

7. Move selector bracket assembly D5, Fig. 68 toward right and at same time move driving arm Q2, as required, until it becomes disengaged from long slot of selector bracket assembly.
8. Slide driving arm toward left and out of machine from face plate end.
9. Remove selector bracket assembly D5, from machine.
10. Loosen set screw K5, Fig. 68 (Inset), and remove pin E5 with its bracket L5 and spacing collar M5 from machine, as shown in Fig. 68.

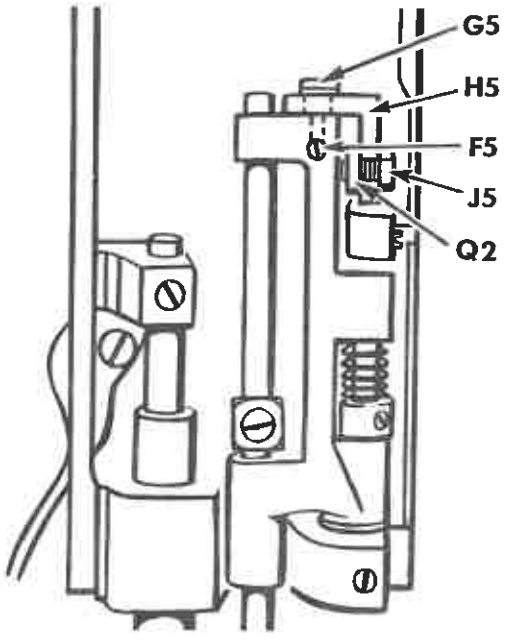


Fig. 69. Removing Needle Bar Driving Arm

REPLACEMENT:

Replace needle position selector lever assembly and needle bar driving arm in the reverse order of their removal. Observe the following:

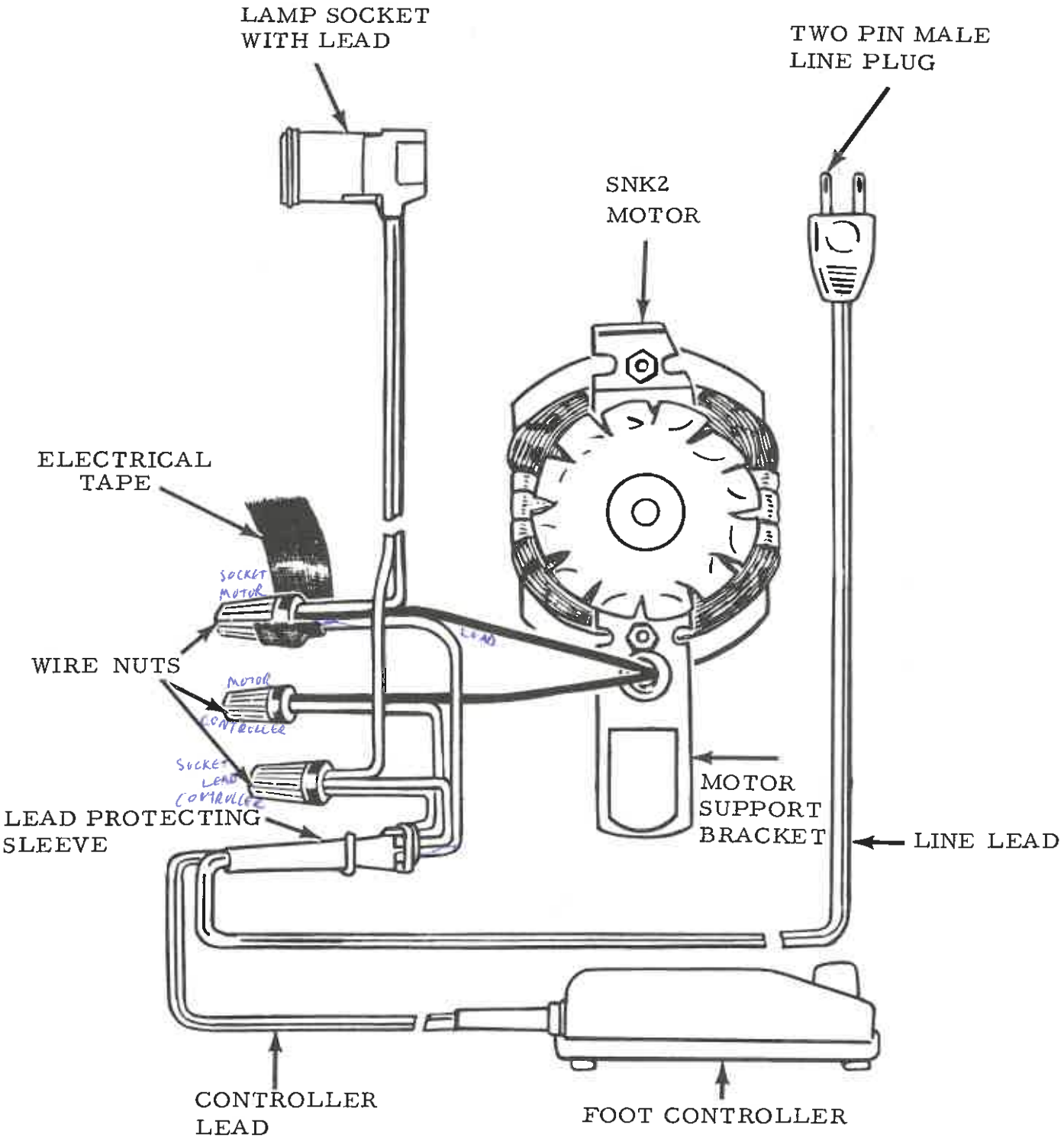
REMOVALS AND REPLACEMENTS

NEEDLE POSITION SELECTOR LEVER ASSEMBLY AND NEEDLE BAR DRIVING ARM

(Continued from page 38.)

1. Fit bracket L5 and collar M5 on pin E5 and assemble to machine arm. Do not tighten set screw K5.
2. Replace selector bracket assembly D5.
3. Insert driving arm Q2, from face plate end, into machine arm and fit right end of arm on fork of selector bracket assembly, as shown in Fig. 68.
4. Insert pin C5 through holes provided for it in brackets D5 and L5.
5. Replace needle position lever assembly B5, fitting large fork in groove N5 of pin E5 and small fork in groove P5 of pin C5.
6. Press pin E5 down and tighten set screw K5.
7. Replace and tighten screw A5.
8. Replace hinge pin G5, Fig. 69 and tighten set screw F5.
9. Replace cam stack and stitch width lever assembly as intructed on page 37.
10. Replace stitch width and needle position indicator plate.
11. Time machine as instructed on pages 29 to 36.

WIRING DIAGRAM



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MACHINES 327K and 328K

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Form K6646
(465)

SERVICE MANUAL
FOR
SINGER* SEWING MACHINES
OF
CLASS 338

For detailed information concerning operation, threading, choice of needles, etc., see instruction book:

Machine 338—Form K6620 (For U.S.A. and Canada) and K6649 (other than U.S.A. and Canada)

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DESCRIPTION

Machine 338

For straight, zigzag and ornamental stitching.

Flat bed aluminium machine.

Foot power (Machine 338/1) with built-in light.

Electric power (Machine 338/3) with built-in SNK4 (double insulated) Motor and Light (hinged).

Dual purpose foot power or electric drive (Machine 338/4).

Electric power specially grounded for schools (Machine 338/6).

Horizontal oscillating hook on a vertical axis, with stationary bobbin case, located in front of needle.

Movable bobbin case cushion spring for easy removal of bobbin case.

Throat plate held in position by a position pin and spring loaded clamp for easy removal.

Throat plate lifting plate supplied with attachment set.

Lock stitch, drop feed, link take-up.

Bight control lever on front of arm in direct view of the operator. The lever controls the width of the zigzag or ornamental stitch, up to a maximum of 4 mm. When the machine is to be used for straight sewing in either left, centre or right needle position, this lever is placed in the "O" position.

Needle position selector lever on front of arm in direct view of the operator. The lever enables the needle to be set in left, centre or right position.

Control panel. This panel contains the trade-mark, machine class number, stitch graduations (in stitches per inch and length of stitch in millimetres), indications for needle position selector lever, and indications for bight control lever.

The feed regulator lever can be adjusted for fine regulation of the short stitch in the satin stitch area above 20, and a notch is provided in the stitch indicator backing plate for positive long stitch.

Hinged disc cover plate at top of arm holds one spool pin.

Numerically graduated thread tension device, with central spacing disc for two needle threads.

Reversible feed, adjustable.

Semi-automatic bobbin winder partially enclosed in arm adjacent to hand wheel.

Bed—16-1/2 inches long—7 inches wide.

Working space at right of needle—7-1/8 inches.

Needle Catalogue 2020 (15×1)—threaded from front to back. Single or two needle stitching.

Maximum stitch length—6 per inch.

Needle bar stroke—1.183 inches.

Presser bar lift—.290 to .300 inch.

Maximum width of zigzag stitch (bight), approximately 5/32 inch (4 mm.).

Speed—maximum speed at the rated voltage not less than 900 r.p.m.

31 varieties of FASHION* discs are available. Those not furnished with machine can be supplied at an additional charge. Each disc produces a particular decorative stitch and is manually inserted into machine.

PREPARATION OF MACHINE FOR INSPECTION

Before any extensive inspection is undertaken to find causes of faulty operation, machine should be thoroughly cleaned and oiled.

Remove all lint, dust or foreign particles from machine.

Wipe machine clean and dry.

Oil the machine as instructed below and on page 5.

Wipe away all surplus oil.

NOTE: Under extreme conditions (if grease or dirt has become considerably hard or tacky), the motor, light and wiring harness should be removed as instructed on pages 16, 17 and 18, and the machine should be dipped in a container of Varsol until the impurities have been removed.

LUBRICATION

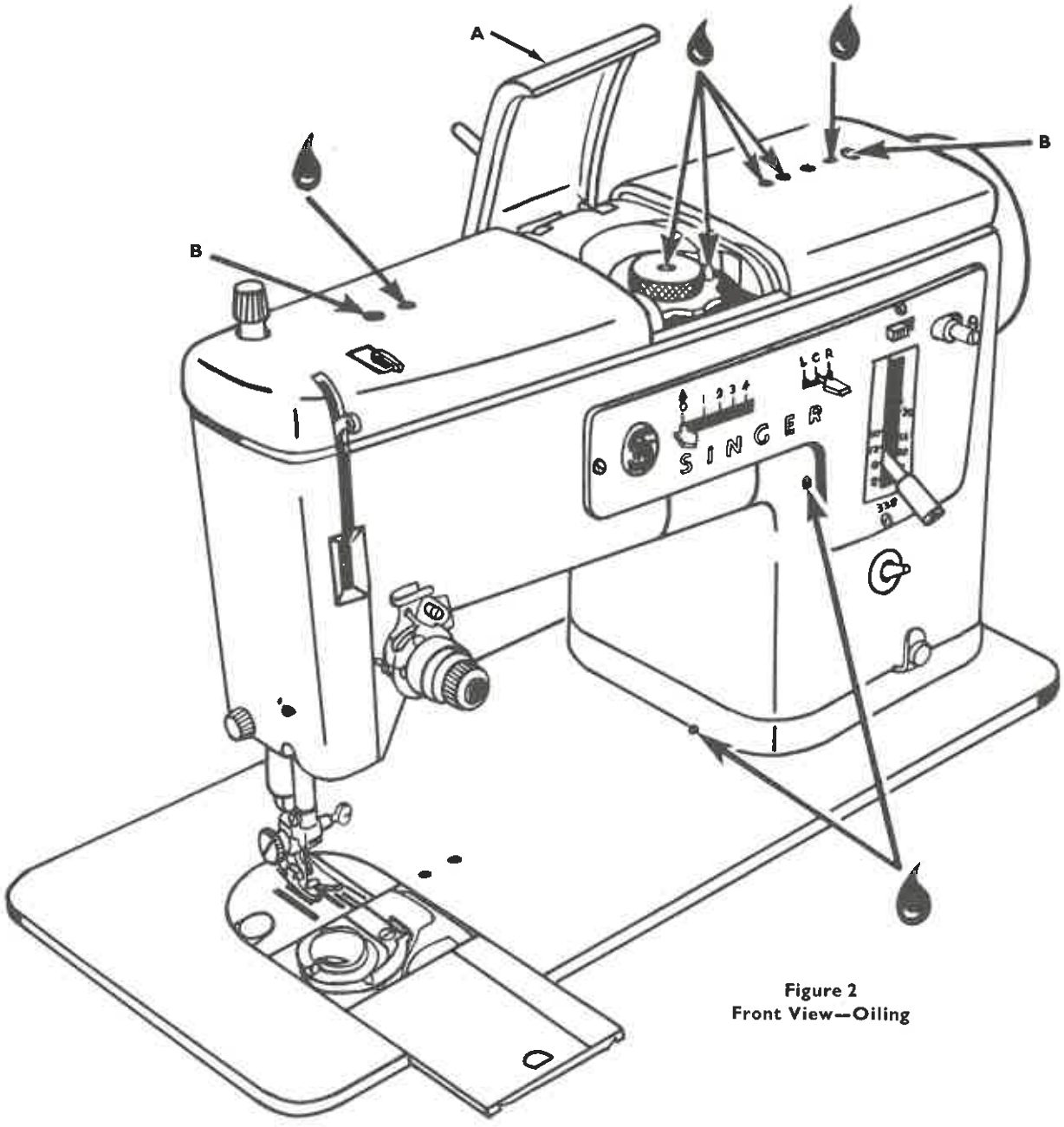


Figure 2
Front View—Oiling

Disconnect Machine from electricity supply before removing Arm Top Cover or Bed Cover Plate.

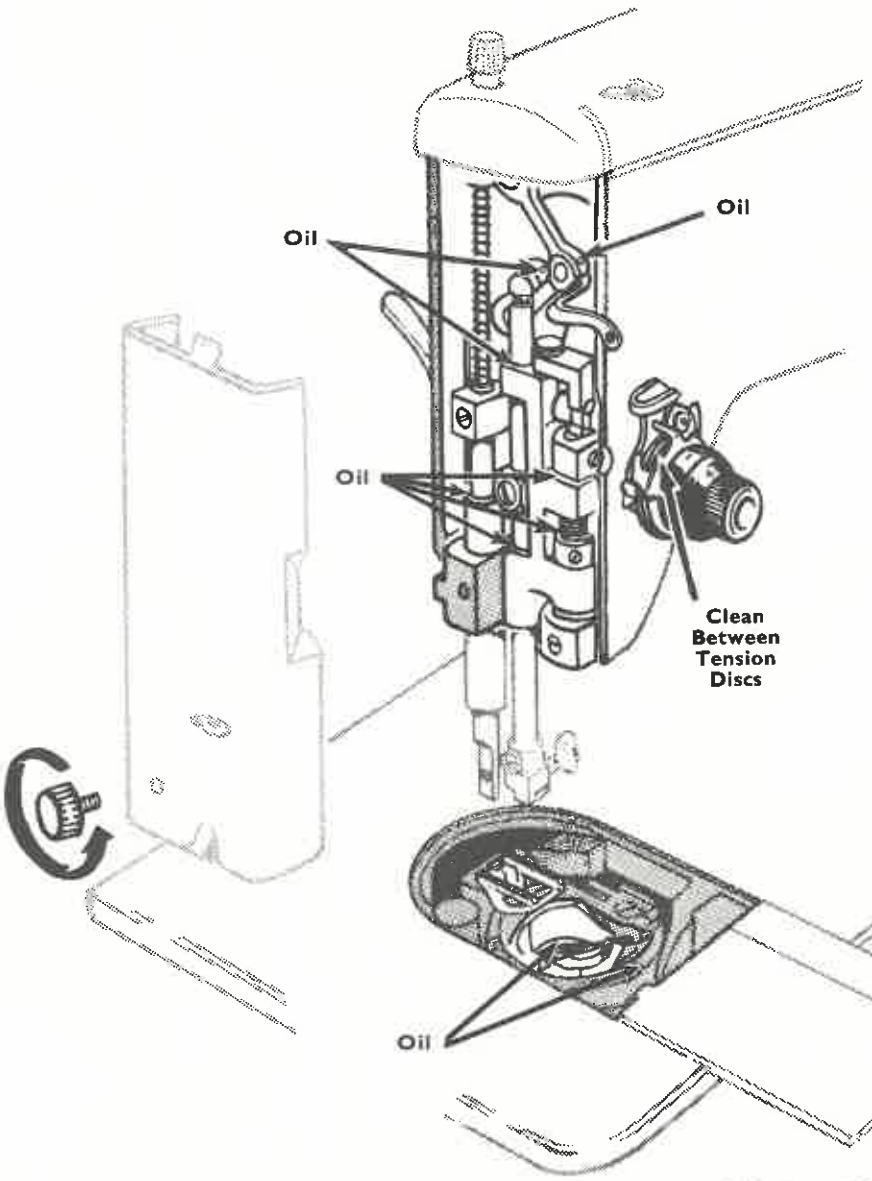


Figure 3
End View—Oiling

Raise disc cover Plate A. Loosen two screws B, Fig. 2 and remove arm top cover. Apply SINGER* Gear Lubricant to gears as shown in Fig. 4.

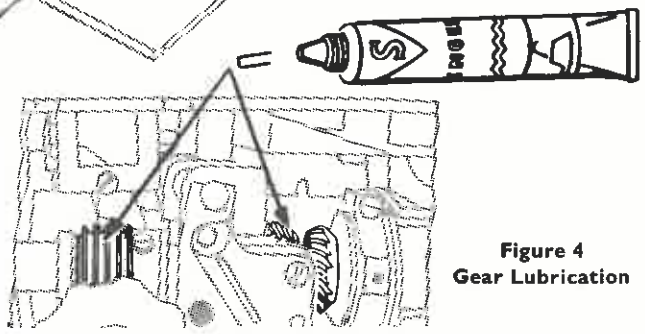


Figure 4
Gear Lubrication

Tilt machine back and remove thumb nut from screw G, being careful not to lose felt washer, and remove cover from underside of machine.

Oil each of the places indicated by arrows. Avoid getting oil on any part of the motor.

Replace bottom cover. **THE MOTOR REQUIRES NO LUBRICATION**

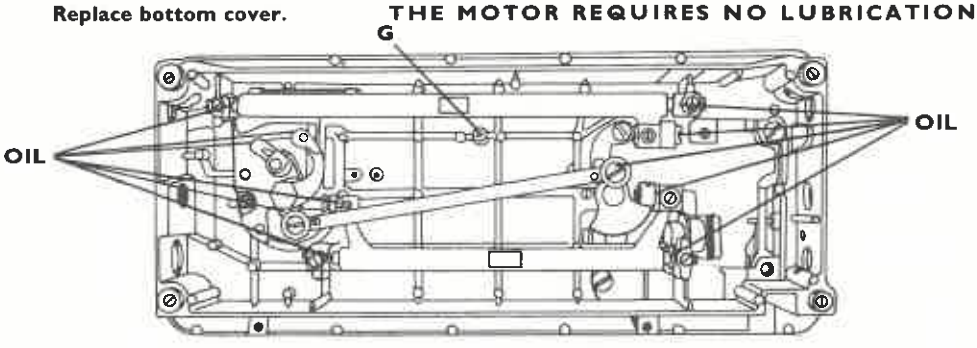


Figure 5 Bottom View—Oiling

TO SET PRESSER FOOT AT CORRECT HEIGHT

IMPORTANT: Unless presser foot is set at correct height, attachments for these machines may not function properly on presser bar.

CAUTION: Throat plate must be flush with bed slide while setting presser foot height.

CHECK:

Raise presser bar lifter, raising presser foot to highest position. Bottom of presser foot should be .290 to .300 inch above top of throat plate.

Test alignment of presser foot to feed slots in throat plate. Fig. 7 shows presser foot in correct alignment. Height and alignment of presser foot must be set at the same time.

SETTING:

1. Loosen set screw C, Fig. 6.
2. Raise or lower presser bar, as required.
3. Align presser foot and securely tighten set screw C.

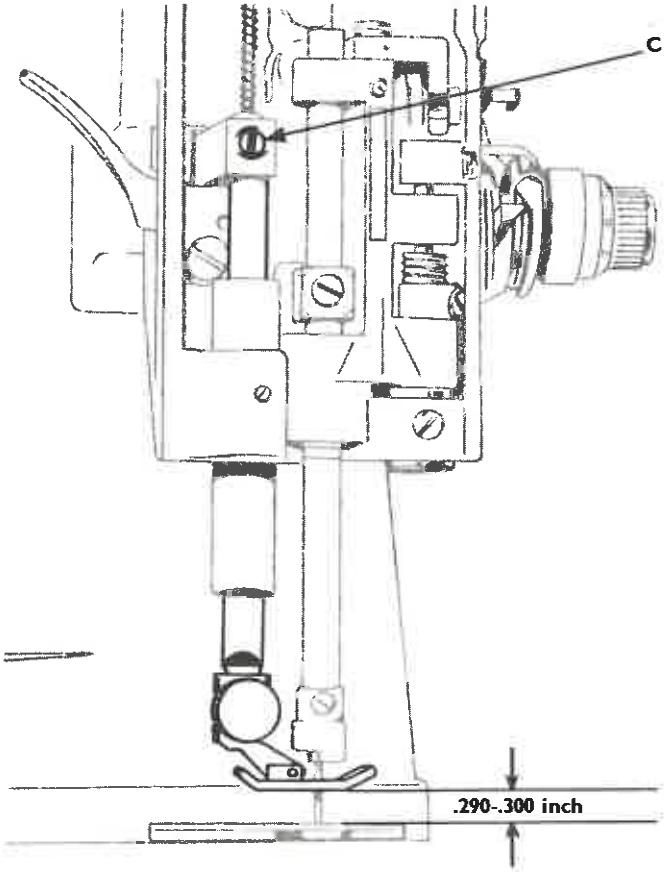


Figure 6
Setting Presser Foot at Correct Height

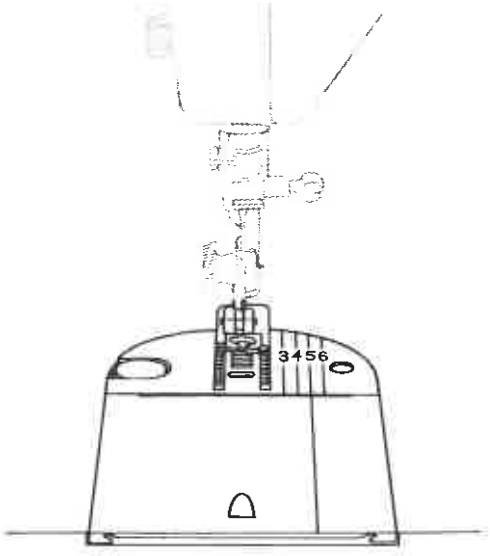


Figure 7
Presser Foot in Alignment with Slots in Throat Plate and with Feed Dog

TO SET FEED DOG SIDEWISE IN THROAT PLATE SLOTS AND TO ELIMINATE END PLAY OR BINDING OF FEED ROCK SHAFT AND FEED LIFTING ROCK SHAFT

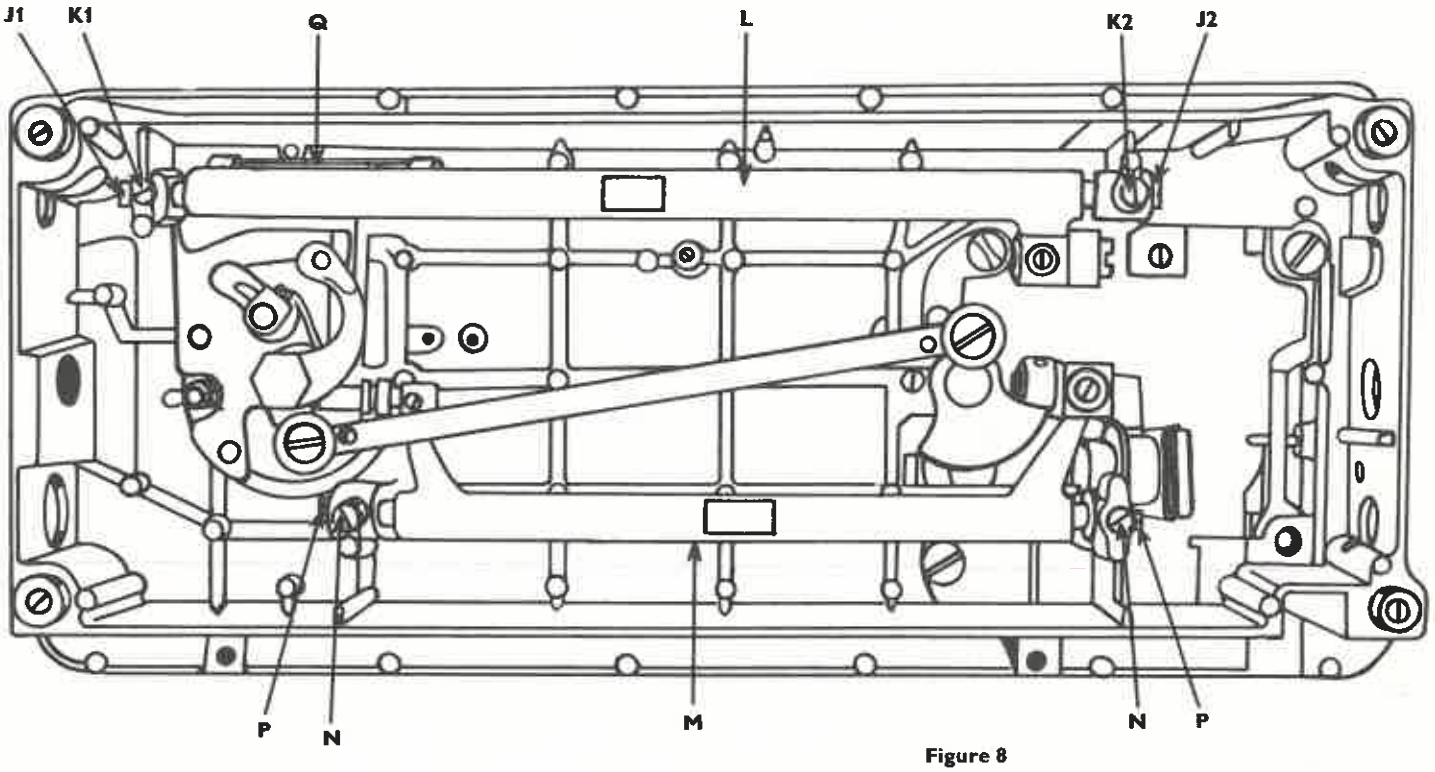


Figure 8
Setting Feed Dog Sidewise and Adjusting for End Play or Binding

PREPARATION:

1. Remove bottom cover plate.
2. Set feed dog at correct height as instructed on page 8.

CHECK:

Feed dog should be located centrally (along the bed) in feed slots of throat plate.

SETTING: (See Fig. 8)

1. Loosen set screws K1 and K2 which hold screw centres J1 and J2 and feed rock shaft L in position.
2. To position feed dog toward left, loosen screw centre J1 and tighten screw centre J2 an equal amount, as required.
3. To position feed dog toward right, loosen screw centre J2 and tighten screw centre J1 an equal amount, as required.
4. When feed dog is centralised in throat plate, make certain that screw centres J1 and J2 hold feed rock shaft L snugly (without end play or binding).
5. Then securely tighten screws K1 and K2.

CHECK FOR BINDING OR END PLAY OF FEED LIFTING ROCK SHAFT.

SETTING:

1. Loosen set screws N which hold screw centres P and feed lifting rock shaft M in position.
2. Tighten screw centres P equally upon shaft M so that shaft M rides freely without end play or binding.
3. Then securely tighten screws N.

Should feed shafts L and M still bind, check feed bar Q for end play or binding.

SETTING:

Remove feed rock shaft and feed bar assembly as instructed on page 22, and adjust feed bar screw centres as required.

FEED TIMING

CAUTION: Feed eccentric is correctly set at the factory. This timing should not be altered.

TO SET HEIGHT OF FEED DOG

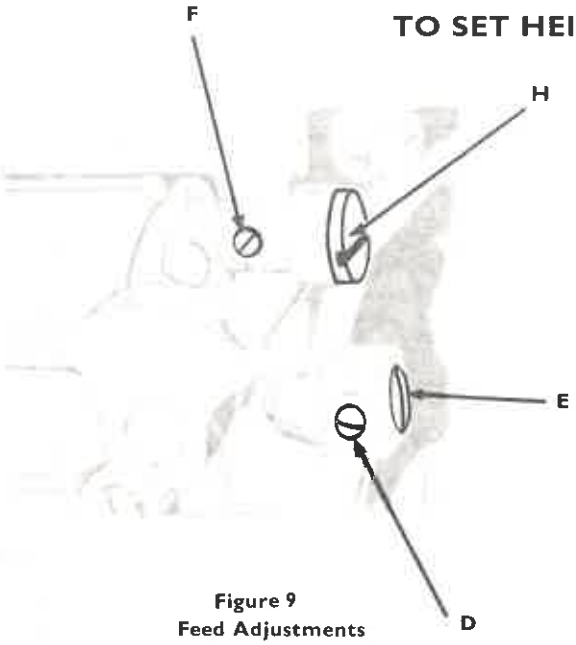


Figure 9
Feed Adjustments

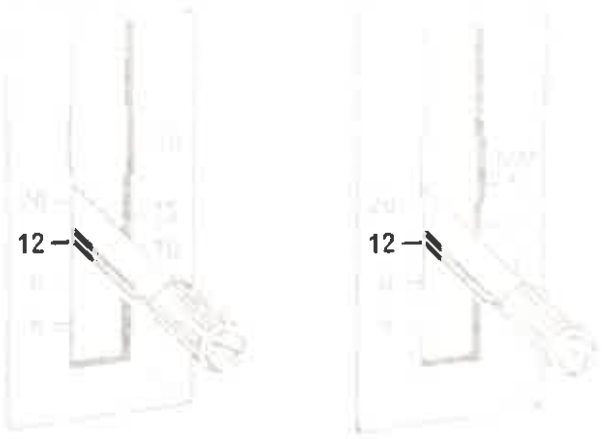


Figure 9a
Stitch Length Regulator Set for 12 Stitches

PREPARATION:

1. Remove bottom cover.
2. Set stitch length regulator for 12 to 15 stitches per inch, or equivalent stitch length of 2 mm. as shown in Fig. 9A.
3. Turn hand wheel over toward you until feed dog is at its highest position.

With feed dog at its highest position, slightly less than a full depth of teeth should project above top surface of throat plate, as shown in Fig. 10.

SETTING:

1. Turn hand wheel over toward you to bring feed dog to its highest position.
2. Loosen set screw D, Fig. 9.
3. Turn eccentric stud E clockwise or counter-clockwise, as required, to bring feed dog to correct height.
4. While Maintaining this setting, securely tighten set screw D.

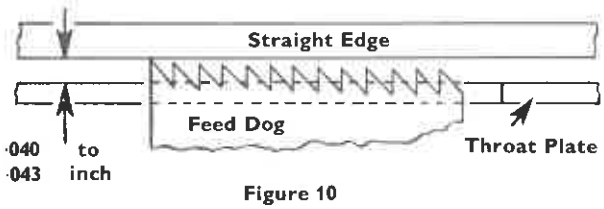


Figure 10
Feed Dog at Correct Height

TO SET FEED DOG LENGTHWISE, IN THROAT PLATE SLOTS

PREPARATION:

1. Set feed dog at correct height as instructed above.
2. Set stitch length regulator for 12 to 15 stitches per inch, as shown in Fig. 9A.

CHECK:

While turning hand wheel over toward you, feed dog should come as close as possible to front of throat plate slots without striking throat plate.

SETTING:

1. Loosen set screw F, Fig. 9.
2. Turn eccentric stud H, moving feed dog toward front or rear, as required.
3. While correct setting is maintained, securely tighten set screw F.

TO SET THE TAKE-UP SPRING

SETTING THE STROKE: (See Fig. 11)

The take-up spring R should complete its action and be at rest against stop S as point of needle enters fabric.

Loosen screw T and move slack regulator U down (to the right) to complete take-up spring action earlier (shorter stroke); move regulator U up (to the left) to complete take-up spring action later (longer stroke).

Then tighten screw T.

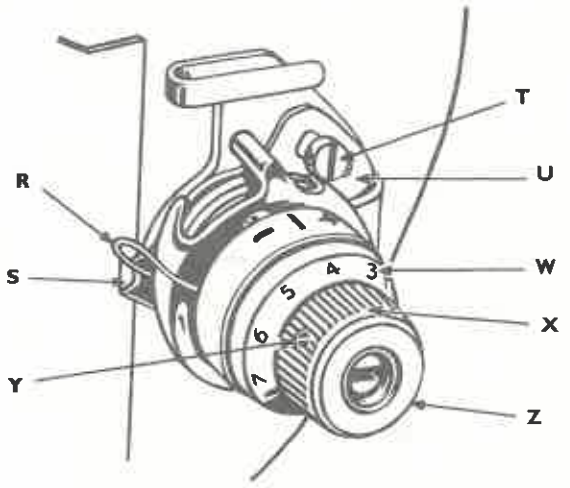


Figure 11
Setting the Stroke

SETTING THE TENSION:

Tension on take-up spring should be just sufficient to take up slack of needle thread until point of needle reaches fabric.

Turn hand wheel over toward you until set screw A1, Fig. 12, is accessible to screw driver, loosen set screw and remove entire tension assembly.

Turn numbered dial to "O" releasing all tension. Hold tension assembly so that component parts are in position shown by dotted line in Fig. 13. Place spring end D1 in groove of sprocket E1 so that take-up spring R hangs down in a vertical position. This is the normal setting.

To increase tension on take-up spring, move spring end D1 right to next groove of sprocket E1; to decrease tension, move spring end left to next groove.

Replace assembly, draw take-up spring so that it rests on regulator stop S, Fig. 11, and recheck tension. Tighten stud set screw A1, Fig. 12.

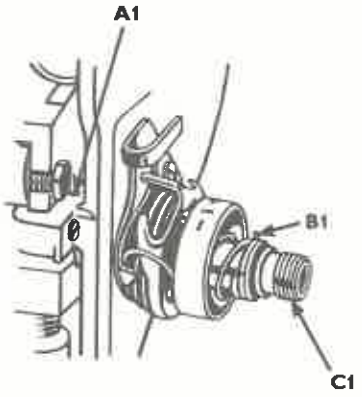


Figure 12
Stud Set Screw

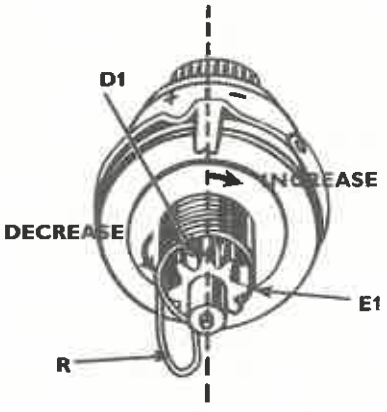


Figure 13
Setting the Tension

TO ADJUST NEEDLE THREAD TENSION

CHECK:

1. Use #50 mercerized thread.
2. Lower presser bar to engage tension.
3. Turn thumb nut X, Fig. 11, together with flange W, over toward left as far as it will go. At this setting there should be a slightly perceptible tension on needle thread (between 5 and 15 grams on Tensometer).

ADJUSTMENT:

1. Loosen set screw Y and remove thumb nut X with cap Z.
2. Remove flange W.
3. Place thread between tension discs and turn adaptor C1, Fig. 12, as required, to obtain a slightly perceptible tension (between 5 and 15 grams on Tensometer).
4. Replace flange W, Fig. 11, so that stop on inside of flange is to right of stop washer extension B1, Fig. 12.
5. Hold flange W, Fig. 11, against tension assembly and tighten nut X (open side out) against flange.
6. Place cap Z into nut X and tighten set screw Y.
7. Recheck tension on needle thread.

TO ADJUST THREAD CLEARANCE

PREPARATION:

Open slide plate and remove throat plate.

Move hook point to cast off position as illustrated in Fig. 14.

CHECK:

Using a narrow Feeler Gauge, check clearance between heel of bobbin case and cushion spring. Clearance should be .010 to .015 inch, as shown at right.

SETTING: (See Fig. 14)

1. Loosen screw G1, insert Feeler Gauge between spring and heel of bobbin case, and move spring as required.
2. Then securely tighten screw G1.

NOTE: Washer and hole in spring for screw G1 are oversized to permit adjustment for correct clearance.

Inspect cushion spring and screws F1 and G1 for wear and possible need for replacement.

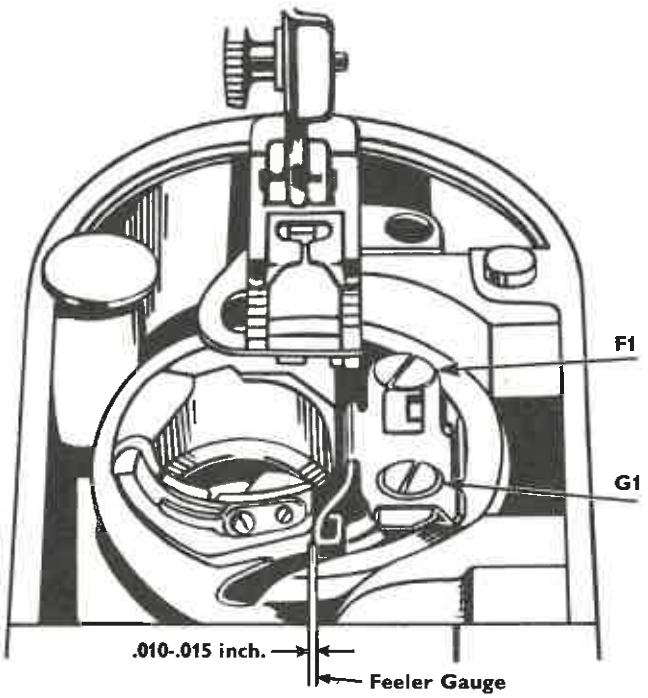


Figure 14
Thread Clearance

TO SET NEEDLE BAR AT CORRECT HEIGHT

PREPARATION:

1. Set needle position lever at "L" and stitch width lever at "O".
2. Insert two needles (same size) up into needle clamp.

CHECK:

1. Turn hand wheel over toward you until needle bar is at its lowest point. At this position, the UPPER TIMING MARK on needle bar should be aligned with lower end of needle bar frame, as shown in Fig. 15.
2. Then turn hand wheel over toward operator until hook radius is behind needles. If needle bar is correctly turned, both needles will be an equal distance in front of hook radius as shown in Fig. 15A.

SETTING:

1. With needle bar at its lowest point, loosen screw H1 and raise or lower needle bar as required.
2. While maintaining correct needle height, make certain needle bar is correctly turned, then tighten screw H1.

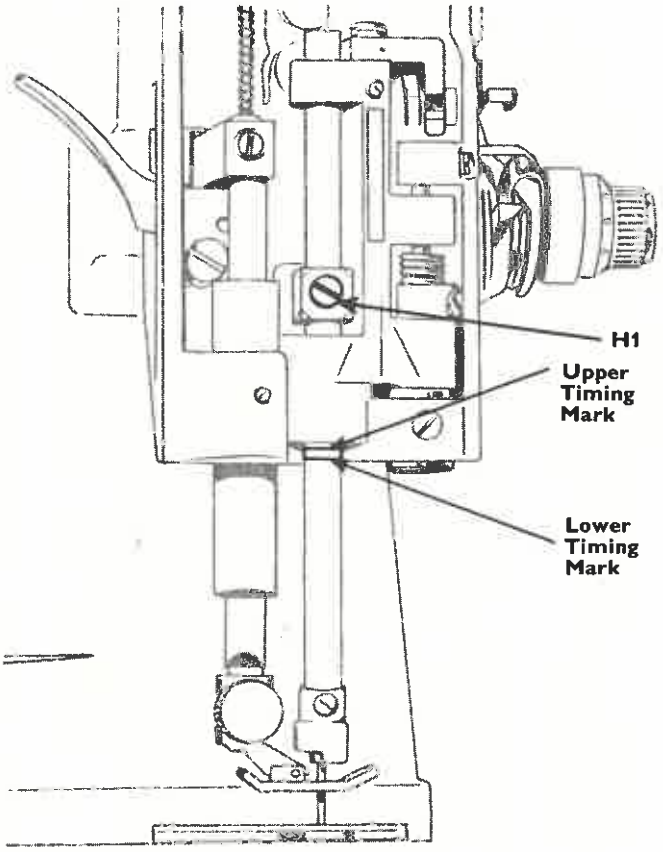


Figure 15
Setting Needle Bar at Correct Height

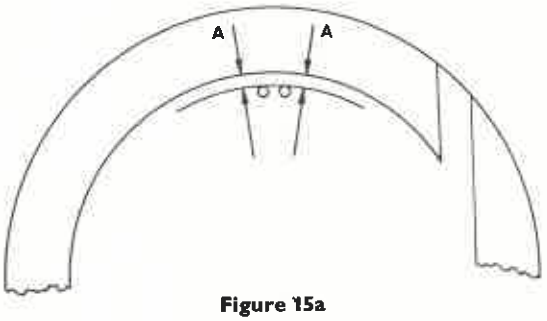


Figure 15a
Position of Needles in Relation to Hook Radius

TO CHECK THE POSITION OF THE NEEDLE IN RELATION TO STRAIGHT-STITCHING THROAT PLATE

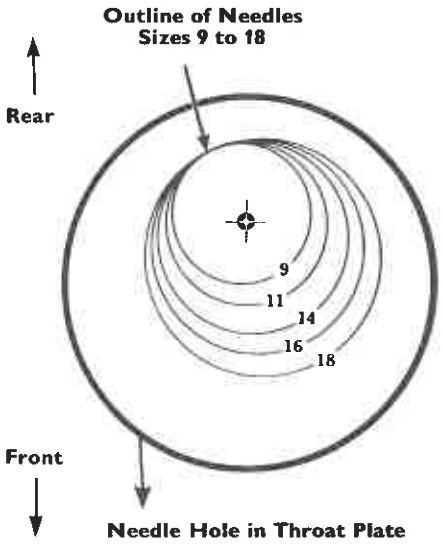


Figure 16
Needle Hole in Straight-Stitching Throat Plate

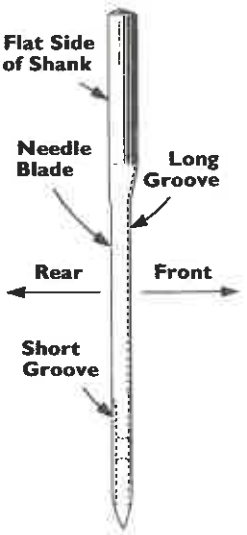


Figure 17
Catalogue #2020
(15 x 1) Needle

PREPARATION:

1. Install straight-stitching throat plate.
2. Set needle position selector lever at "C" and stitch width lever at "O".

CHECK:

When needle enters the needle hole in straight-stitching throat plate, the short-groove (flat shank) side of the needle should face slightly to right of rear, as shown in Fig. 16.

Although the size of the needle may be changed to suit sewing requirements, the position of the flat shank side of the needle remains CONSTANT in relation to the needle hole in the throat plate.

Observe that the centre of a Size #11 needle should be at the approximate centre of the needle hole in the throat plate and that the centre of each larger size needle advances toward the front of the needle hole.

This position is necessary to permit an increase in the diameter of the needle blade toward the front without disturbing the proper relationship between the needle and the sewing hook. This position of the needle will also maintain sufficient clearance for the needle thread.

At no time should the needle touch the edge of the needle hole. The needle should never strike the presser foot.

If the needle is incorrectly located in the throat plate hole:—

1. Needle bar setting may be incorrect from front to back or from right to left (See pages 28 and 29).
2. Needle or needle bar may be bent (Replace).
3. Needle seat in needle bar may be clogged with dirt or may be damaged.
4. Throat plate may be incorrectly seated.

If the needle strikes the presser foot, any of the above conditions may be at fault, or:—

1. Presser bar may be bent, damaged or turned out of position (see page 6).
2. Presser foot may be incorrectly seated on presser bar.
3. Presser foot may be bent (Replace).

TO ELIMINATE END PLAY OR BINDING OSCILLATING HOOK SHAFT AND OSCILLATING HOOK CRANK

To eliminate end play or binding of hook shaft L1 and crank M1, loosen set screw N1. Then, while pressing downward upon hook from top of machine, set crank M1 firmly against hook shaft bushing in direction of hexagon nut P1.

Securely tighten set screw N1 making certain it enters timing groove of hook shaft L1.

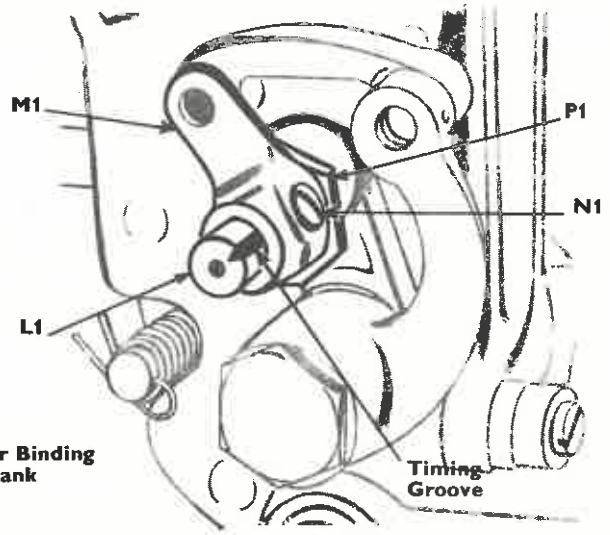


Figure 18
Adjustment for End Play or Binding of Hook Shaft and Crank

TO ELIMINATE END PLAY OF UPRIGHT ARM SHAFT

CAUTION: Do not disturb mesh between bevel gears when making any adjustments of upright and horizontal arm shafts. These gears have been lapped together at the factory and should be kept in mesh throughout all adjustments or replacements.

End play in upright arm shaft may be due to excessive clearance between lower bushing and pitman crank.

PREPARATION:

1. Remove arm top cover and bottom cover plate (See page 5).

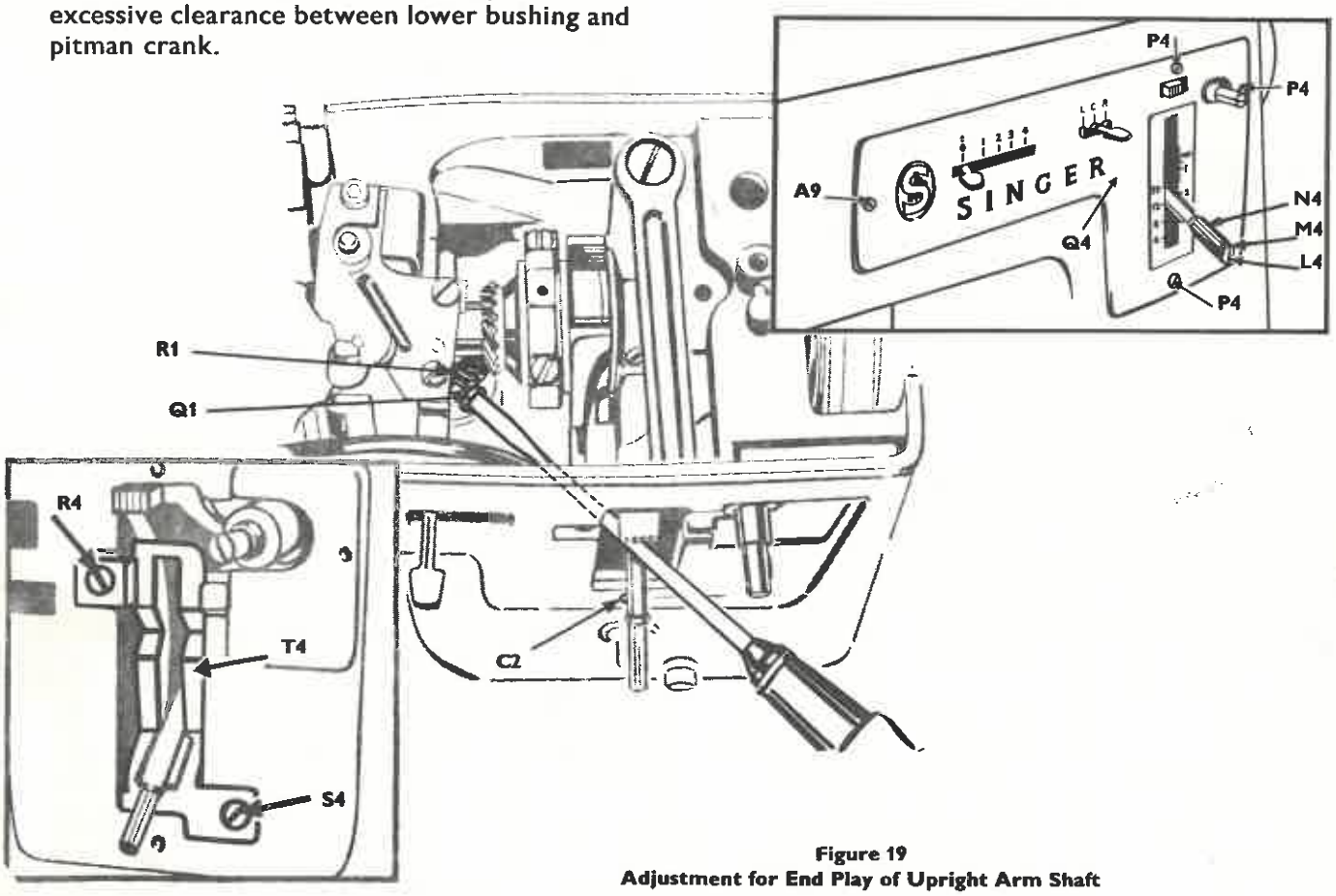


Figure 19
Adjustment for End Play of Upright Arm Shaft

To Eliminate End Play of Upright Arm Shaft—*continued*

2. Raise stitch indicator lever to notch in area above 20, loosen three screws P4, stud A9 and remove indicator plate Q4 from machine.

3. Remove top backing plate screw R4, Fig. 19, while holding light lead retaining clip and nut inside arm, remove bottom screw S4 and allow backing plate T4 (Fig. 19) to hang on lever.

ADJUSTMENT:

1. Insert screw driver through cut-out in machine arm as shown in Fig. 19.

2. Turn hand wheel over toward you until set screws Q1 in bevel gear R1 are accessible to screw driver. Then loosen screws Q1 one-quarter (1/4) turn.

3. While pressing down upon bevel gear R1, press pitman crank (from underside of machine) up against the lower bushing. Then securely tighten gear set screws Q1.

4. Replace backing plate, light lead clip and nut and indicator plate, ensuring that hole in light switch retaining plate is in alignment with hole C2. Replace arm top cover and bottom cover plate.

TO ELIMINATE END PLAY OR BINDING OF HORIZONTAL ARM SHAFT

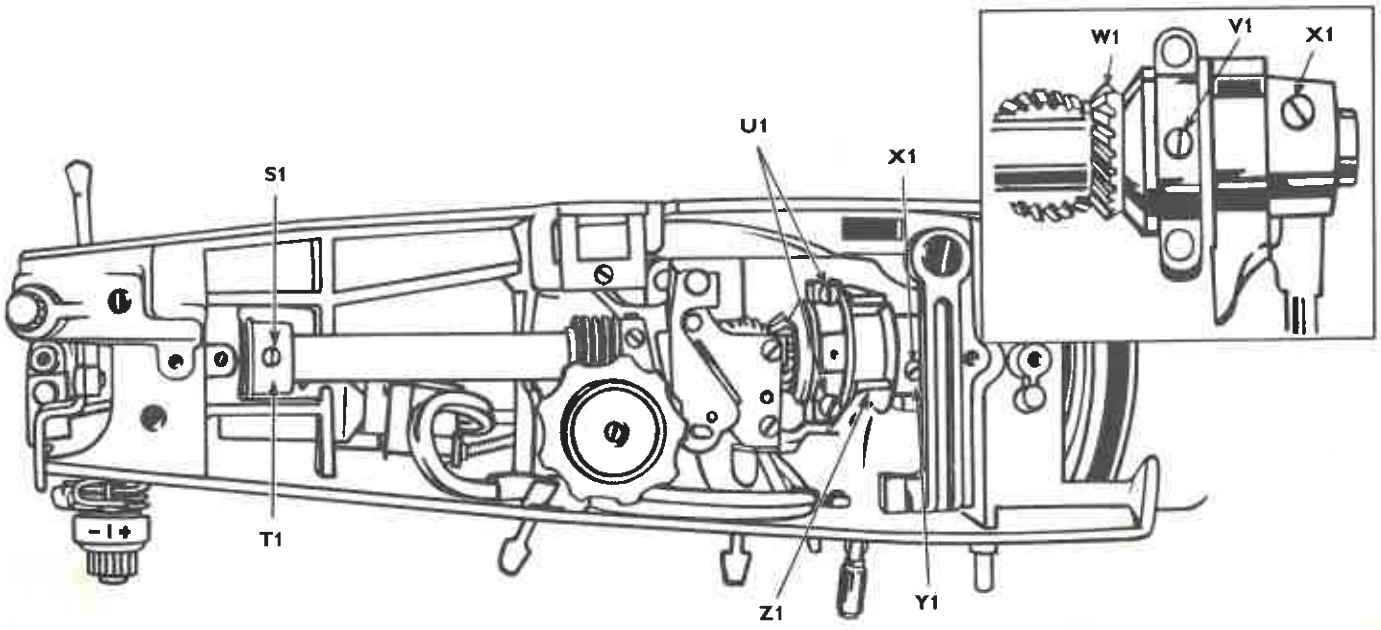


Figure 20
Adjustment for End Play or Binding of Horizontal Arm Shaft

When horizontal arm shaft binds, first check to make certain that mesh between arm shaft worm gear and cam stack worm wheel is not too tight. Do this by setting the cam stack as instructed on page 32.

If arm shaft still requires adjustment for end play or binding, loosen set screws S1 in collar T1. Push needle bar crank toward hand wheel end of machine while firmly pressing collar T1 against bushing in machine head. Then tighten set screws S1.

If arm shaft still binds, remove the two connecting rod cap screws U1 and remove connecting rod cap. Turn hand wheel until timing screw V1 appears in bevel gear W1, as shown in Fig. 20 (Inset). Then loosen timing screws V1 and X1.

While keeping timing screws V1 and X1 aligned with timing groove of arm shaft, press bevel gear W1 firmly in mesh with bevel gear at top of upright arm shaft, without backlash or binding. Then tighten timing screw V1.

Press feed eccentric Y1 gently against feed forked connection Z1 and tighten timing screw X1.

Apply SINGER Gear Lubricant to gears and check for free running of horizontal arm shaft.

Replace connecting rod cap and fasten with cap screws U1.

TO TIME THE OSCILLATING HOOK

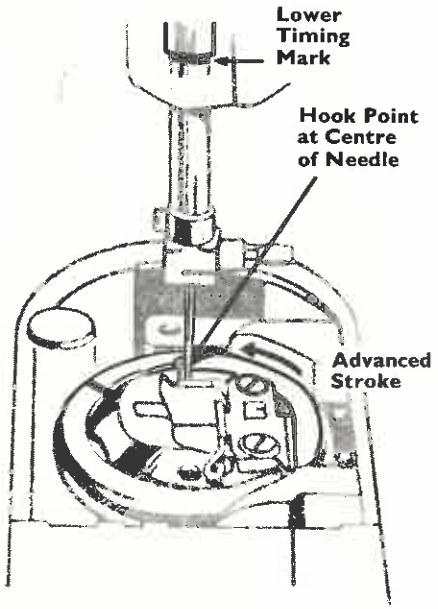


Figure 21
Hook Correctly Timed

PREPARATION:

1. Set needle bar at correct height as instructed on page 11.

2. Time needle bar vibrating mechanism as instructed on pages 28, 29 and 30.

3. Insert a size #18 needle correctly into needle clamp.

4. Remove bottom cover plate, presser foot, throat plate and bobbin case. (Feed dog is removed in Fig. 21 to show point of hook, but it need not be removed to time the hook.)

5. Set needle position selector at "C" and stitch width lever at "O".

CHECK:

Turn hand wheel over toward you until lower timing mark, Fig. 21, is aligned with lower edge of needle bar frame on upward stroke of needle bar.

At this position of needle bar, point of hook should be at centre of needle, as shown in Fig. 21.

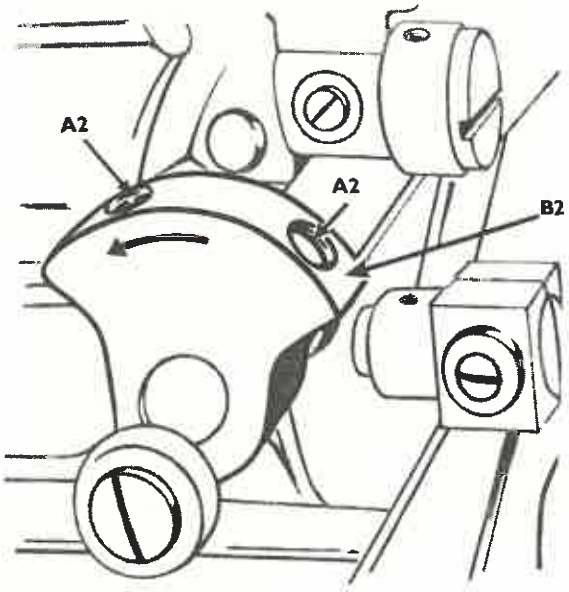


Figure 22
To Time the Hook

SETTING:

1. Loosen the two socket set screws A2, Fig. 22, in crank B2. (Use 1/8 inch Allen key.)

2. While maintaining correct position of needle bar (lower timing mark aligned with lower edge of needle bar frame), turn crank B2 counter-clockwise until hook point, on its advanced stroke, is located directly behind centre of needle, as shown in Fig. 21.

3. Without disturbing position of crank B2, press crank firmly against bushing and tighten socket set screws A2.

4. Replace bottom cover plate, bobbin case, throat plate and presser foot.

REMOVALS AND REPLACEMENTS

UPRIGHT ARM SHAFT

CAUTION: Do not remove the upright arm shaft from this machine. If this becomes necessary, the machine should be returned to the factory.

The two bevel gears have been lapped together at the factory and should be kept in mesh throughout all other removals and replacements.

THE MOTOR

(See Wiring Diagram, page 37)

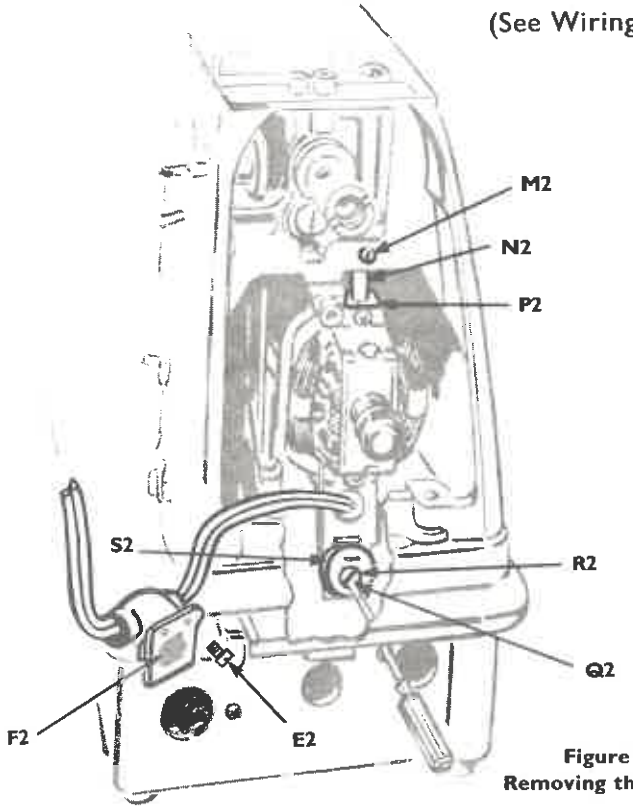


Figure 23
Removing the Motor

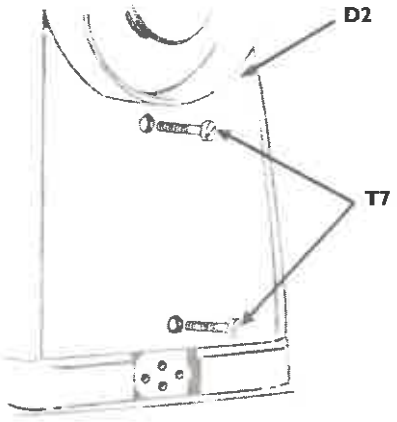


Figure 23a
Removing Arm End Cover

CAUTION: Remove plug from electric outlet before removing any electrical part from machine.

REMOVAL: (See Figs. 23 and 23a)

1. Remove two screws T7.
2. Remove arm end cover D2.
3. Remove arm top cover as instructed on page 5.
4. Remove hand wheel as instructed on page 20.
5. Remove screw E2, receptacle and shroud assembly F2.
6. Ease shroud G2 (Fig. 23b) along leads until it clears receptacle H2.
7. Remove pins L2 using tool G4, Fig. 23c., pushing the removal tool firmly in the direction indicated.
8. Cut leads to double pin and remove shroud G2.
9. Loosen screw M2 and raise bracket post pin N2 until it clears the upper motor bracket P2.
10. Holding motor in position remove lower bracket screw Q2 with its insulating bushing R2 and adjuster S2.
11. Remove motor from machine arm.

REPLACEMENT:

1. Install motor into machine arm and lower bracket post pin N2 through upper motor bracket P2. Tighten screw M2.
2. With screw Q2 and adjuster R2 assembled to slot of lower bracket, fit bushing S2 on adjuster R2 and fasten assembly to machine.

   NOTE: Do not tighten screw Q2 until final adjustment is made.

3. Thread leads through shroud G2 ensuring that both light switch leads are led into left opening and motor leads into right opening.

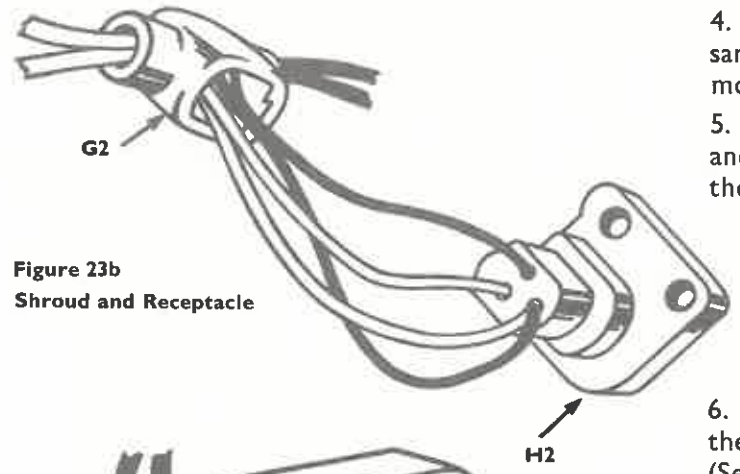


Figure 23b
Shroud and Receptacle

4. Bare end of loose light switch lead to the same length as the bared end of replacement motor lead.

5. Twist bared end of both leads together and insert into the replacement pin. Crimp the pins to the leads by using the crimping tool.

NOTE: In the absence of a crimping tool, these leads may be soldered into the pin. Ensure that all excess solder is removed from the outside of the pin before reinserting into the receptacle.

6. Replace pins in receptacle taking care that they are inserted into their correct holes. (See Figs. 23b and 23c.).

7. Replace shroud and reassemble receptacle and shroud into machine.

8. Replace handwheel and end cover.

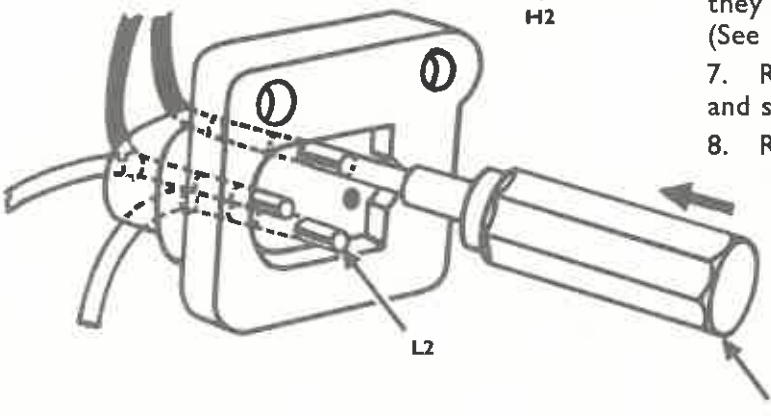


Figure 23c
Removing the Pins

REMOVALS AND REPLACEMENTS
THE LIGHT FIXTURE

REMOVAL:

1. Remove top cover, end cover (See page 16), and hand wheel (See page 20).
2. Remove clip B4, Fig. 24.
3. Unhook lead from clip C4, Fig. 24.
4. Remove FASHION* Disc.
5. Loosen fixing screw E4, Fig. 24, lower light assembly F4, and draw toward left to allow light bracket and spring to clear casting. Lift light assembly upward and toward motor end of machine.
6. Remove plastic nut J4, Fig. 25, and push toggle switch into the arm.
7. Holding light, move switch assembly H4, Fig. 25, out of arm to its fullest extent.
8. Disassemble switch assembly until switch and leads are free from interference from other parts (See Fig. 24a). Remove two connectors K4, Fig. 26, and separate leads.
9. Remove lead from retaining plate.
10. Remove light from arm.

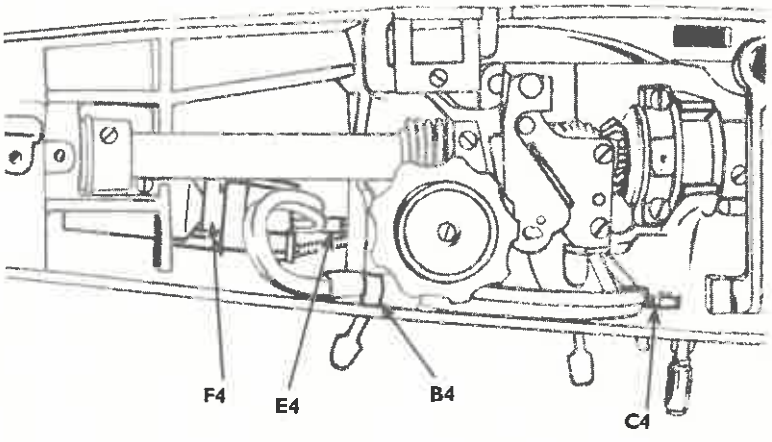


Figure 24
Removing the Light

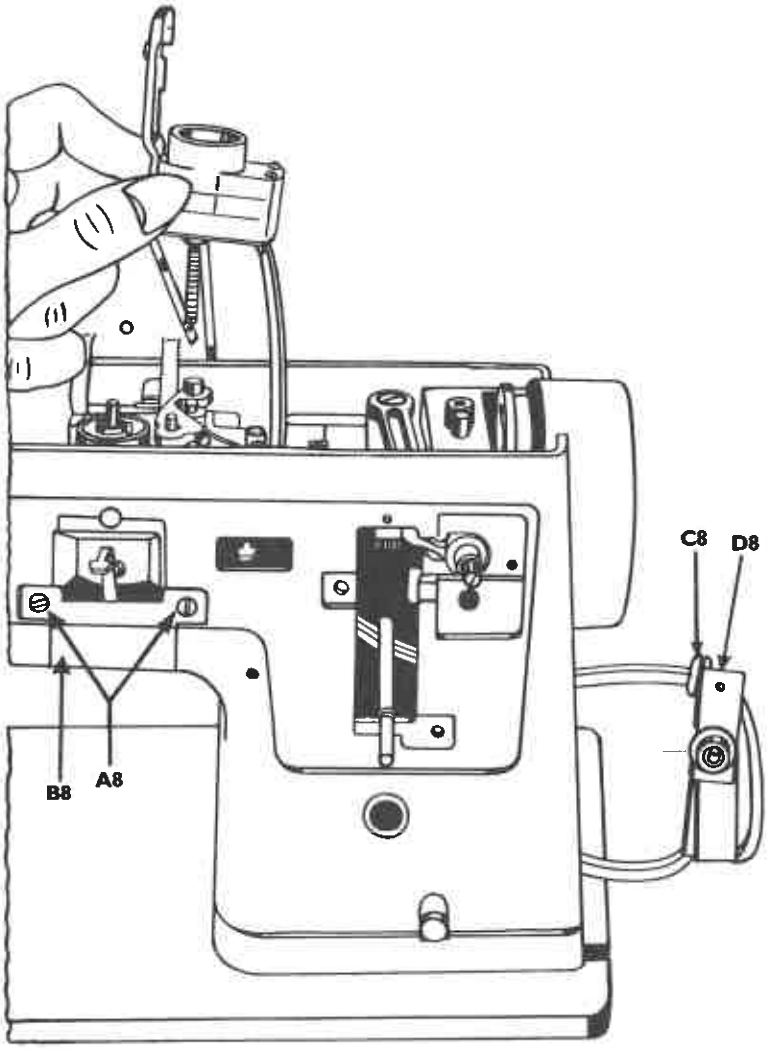


Figure 24a
Light Replacement

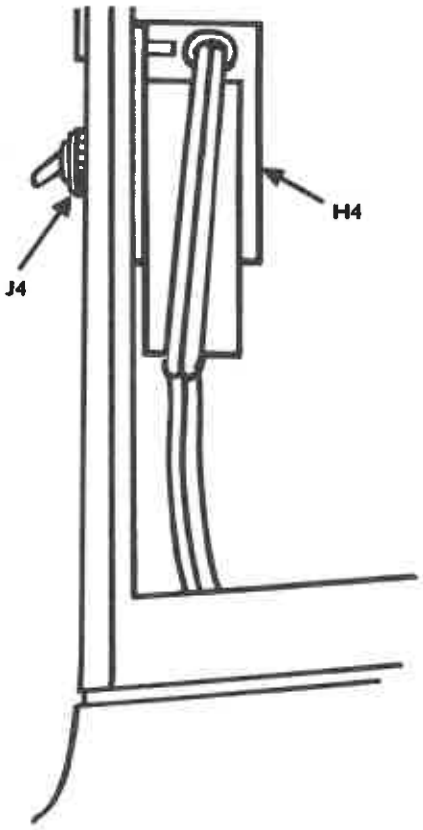


Figure 25
Light Switch—Removal

REPLACEMENTS:

1. Feed light leads down through arm until light is in position shown in Fig. 24a.
2. Feed light leads through grommet, C8, in retaining plate D8.
3. Crimp one light lead to short switch lead and the other light lead to loose lead leading to receptacle with replacement connectors K4, Fig. 26.
4. Reassemble the switch to the retaining plate having first insulated the switch from the plate with the shroud.
5. Assemble light and switch to arm in the reverse order for removal (items 5 to 1) ensuring that small hole in light retaining plate is in alignment with bottom indicator plate screw.

Figure 26
Light Switch Connections

REMOVALS AND REPLACEMENTS

NEEDLE THREAD TENSION

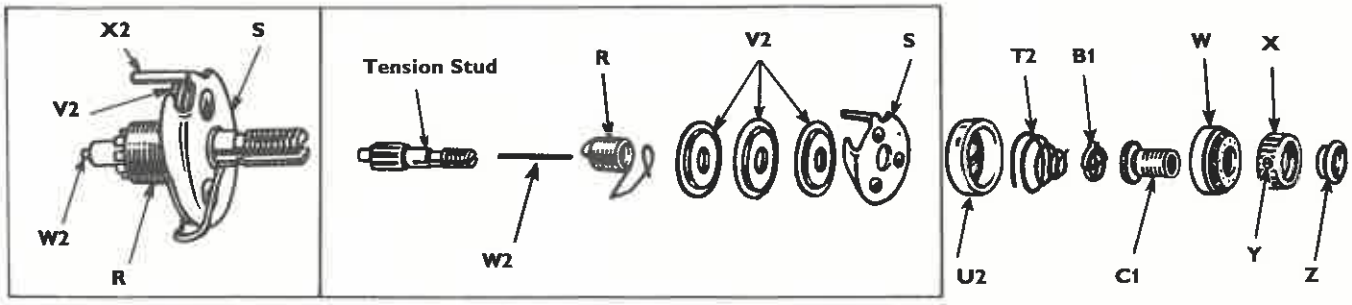


Figure 27
Needle Thread Tension

REMOVAL: (See Fig. 27)

1. Loosen set screw Y.
2. Turn thumb nut X to left (counter-clockwise) to remove nut X and cap Z.
3. Remove tension flange W.
4. Turn adaptor C1 to left (counter-clockwise) to remove it from tension stud.
5. Remove stop washer B1, spring T2 and tension indicator U2 from tension stud.
6. Then, as a unit, remove tension disc assembly (thread guard S, tension discs V2 and take-up spring R).
7. Remove tension releasing pin W2.

NOTE: It is not necessary to remove tension stud from machine. It is shown removed in Fig. 27 to illustrate complete assembly. See page 9 for instructions on removal of tension assembly as a unit.

REPLACEMENT:

1. Make certain that tension releasing pin W2 is in place as shown in inset, Fig. 27.
2. Place tension discs on thread guard S as shown in Fig. 28.
3. Pass take-up spring eyelet Z2 under thread guard with coils of spring above tension discs as shown in Fig. 28.
4. Align coils of spring with holes in discs and place this assembly on tension stud as shown in inset, Fig. 27. Extension X2 of thread guard S enters hole provided in machine head.

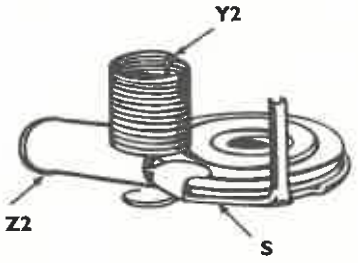


Figure 28

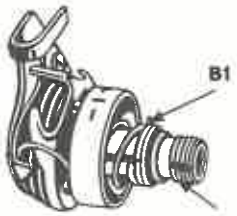


Figure 29

NOTE: Tail Y2, Fig. 28, enters one of the grooves in rear of tension stud (see instructions "SETTING THE TENSION" on page 9).

5. Replace indicator U2, Fig. 27, with open side facing out and with plus (+) and minus (—) signs at top.
6. Hold these assembled parts against shoulder of stud and place tension spring T2, Fig. 27, on tension stud.
7. Place stop washer B1 on stud so that its extension is above tension stud, as shown in Fig. 29.
8. Replace adaptor C1 on tension stud.
9. Place thread between tension discs and turn adaptor C1 as required, to obtain a slightly perceptible tension on thread (between 5 and 15 grams on Tensometer).
10. Replace flange W so that stop on inside of flange is to right of stop washer extension B1.
11. Hold flange W against tension assembly and tighten nut X (open side out) against flange.
12. Place cap Z into nut X and tighten set screw Y.

REMOVALS AND REPLACEMENTS

HAND WHEEL AND FLANGED BUSHING

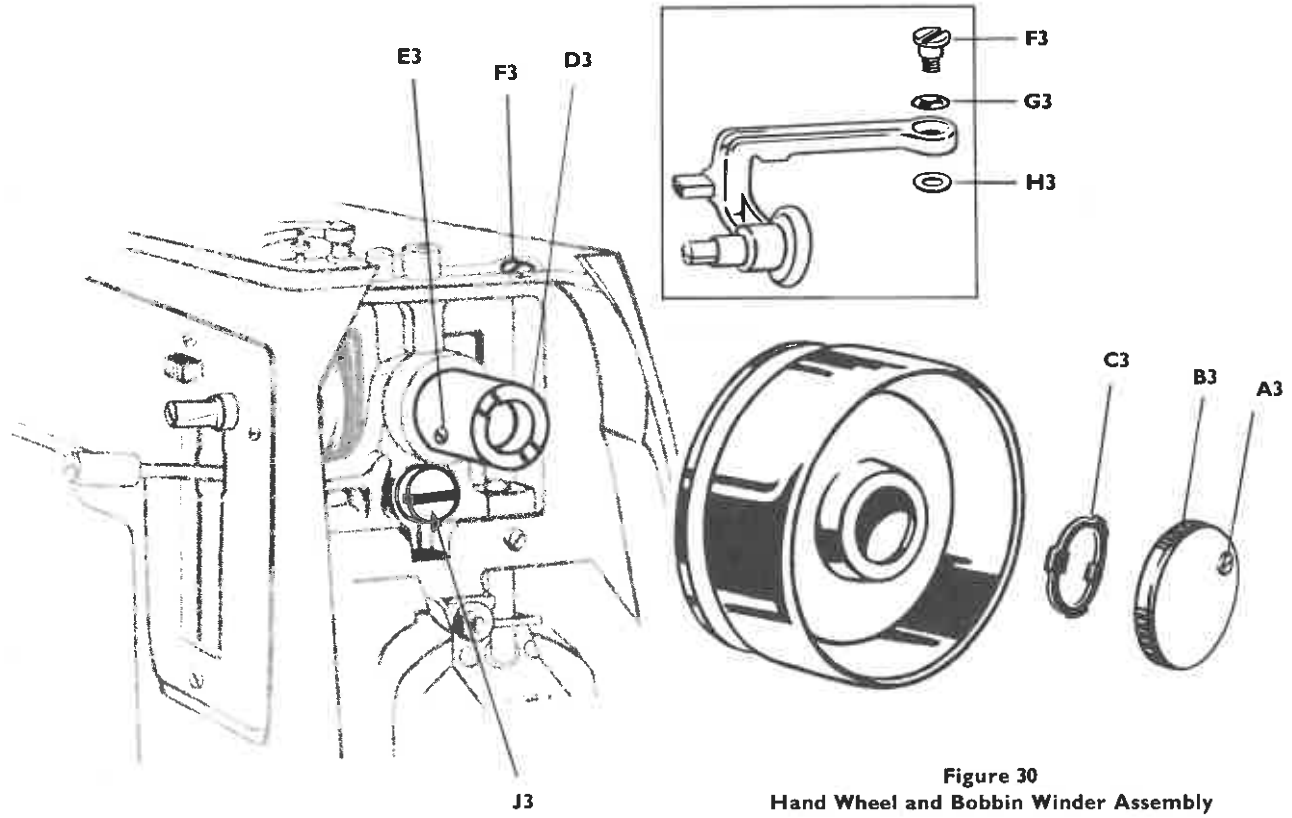


Figure 30
Hand Wheel and Bobbin Winder Assembly

REMOVAL:

1. Remove arm end cover as instructed on page 16, loosen screw Q2, turn bushing R2 (Fig. 23) to disengage motor belt from motor pulley, or for treadle machines disengage treadle belt from band wheel.
2. Remove screw A3 from stop motion screw B3.
3. Remove screw B3, washer C3 and hand wheel from arm shaft.
4. Remove screw E3 and flanged bushing D3 from arm shaft.

REPLACEMENT:

1. Replace flanged bushing D3. Insert screw E3 through flanged bushing as shown above.
2. Replace hand wheel with motor belt in groove of motor hand wheel, or treadle belt in groove of treadle hand wheel.
3. Place motor belt around motor pulley, or treadle belt around hand wheel.
4. Replace stop motion clamp washer C3.
5. Replace and tighten stop motion screw B3 and replace screw A3 in hole of stop motion screw B3.

NOTE: If stitching mechanism is not released when stop motion screw B3 is loosened, remove screws A3 and B3. Remove washer C3, rotate it 180° and replace it on arm shaft. Replace screws A3 and B3.

For removal and replacement of Dual Purpose Treadle/Electric machine handwheel (see page 36)

BOBBIN WINDER

REMOVAL: (See Fig. 30)

1. Remove arm top cover and front panel as instructed on page 13.
2. Remove screw F3 and washer G3, lift bobbin winder assembly from machine arm, taking care to remove washer H3 from below assembly.

REPLACEMENT:

1. Replace bobbin winder in reverse order of its removal.
2. Replace arm top cover and front panel.

REMOVALS AND REPLACEMENTS

STITCH LENGTH REGULATOR

REMOVAL: (See Fig. 31)

1. Remove arm top cover.
2. Remove hand wheel as instructed on page 20. (It is not necessary to remove the flanged bushing).
3. Remove indicator plate as instructed on page 13.
4. Remove Screw L4, Washer M4 and Knurled Nut N4 with slide (see Fig. 19) from Stud V3 (Fig. 31).
5. Move regulator lever V3 to lowest position.
6. Remove large hinge screw J3, Fig. 30, (page 20), with its cup washer from arm casting.
7. Pull regulator out of machine arm.

REPLACEMENT:

1. Install regulator in arm, making certain that regulator fits on slide block of feed forked connection, as shown in Fig. 31.
2. Replace large hinge screw J3, Fig. 30, (page 20), with its cup washer through arm casting and into regulator.
3. Replace backing plate and light lead clip ensuring that light lead is held by clip.
4. Replace Knurled Nut with Slide, Washer and Screw in reverse order of removal.
5. Replace hand wheel as instructed on page 20.
6. Replace arm top cover.

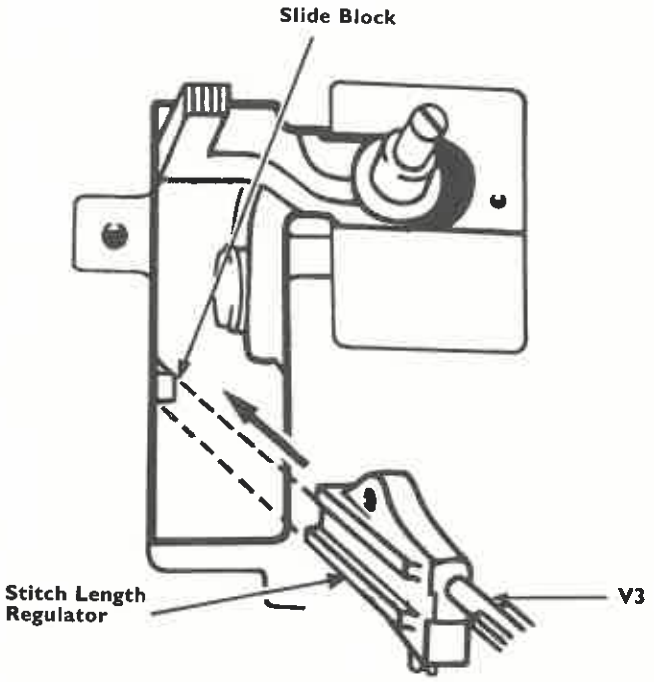


Figure 31
Stitch Length Regulator

FEED LIFTING ROCK SHAFT

REMOVAL: (See Fig. 32)

1. Remove bottom cover plate.
2. Remove snap ring D5, loosen screw U4 and remove eccentric stud V4 disengaging feed lifting rock shaft M from upright connecting rod.
3. Loosen set screw N and remove screw centre P.
4. Remove feed lifting rock shaft M.

REPLACEMENT:

1. Install feed lifting rock shaft M in reverse order of its removal.
2. Adjust feed dog as instructed on pages 7 and 8.

REMOVALS AND REPLACEMENTS

FEED ROCK SHAFT ASSEMBLY

REMOVAL: (See Fig. 32)

1. Remove throat plate and feed dog.
2. Remove bottom cover plate.
3. Remove feed lifting rock shaft M as instructed on page 21.
4. Loosen screw Z4 and remove eccentric stud W4 disengaging feed rock shaft L from feed forked connection.
5. Loosen screw K2 and remove screw centre J2.
6. Remove feed rock shaft L with feed bar assembly.

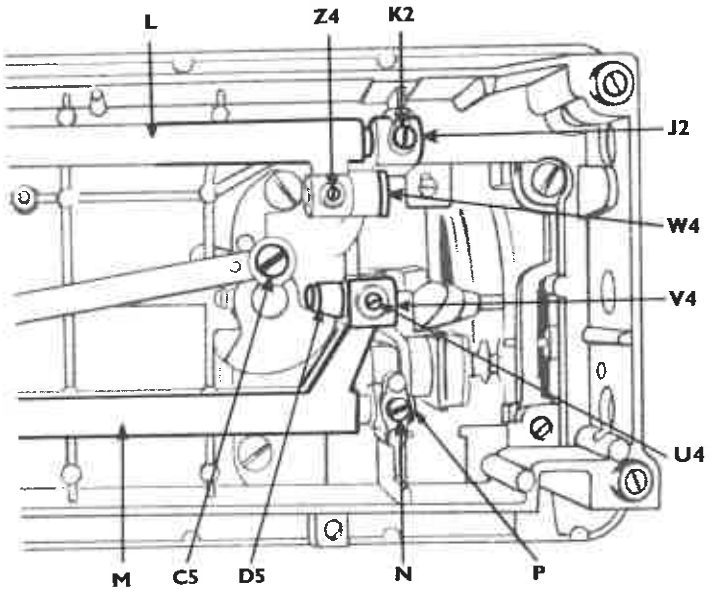


Figure 32
Feed Lifting Rock Shaft and Feed Rock Shaft Assembly

REPLACEMENT:

1. Install feed rock shaft L (with feed bar assembly) in reverse order of its removal.
2. Install feed lifting rock shaft as instructed on page 21.
3. Replace feed dog on feed bar.
4. Adjust feed dog as instructed on pages 7 and 8.

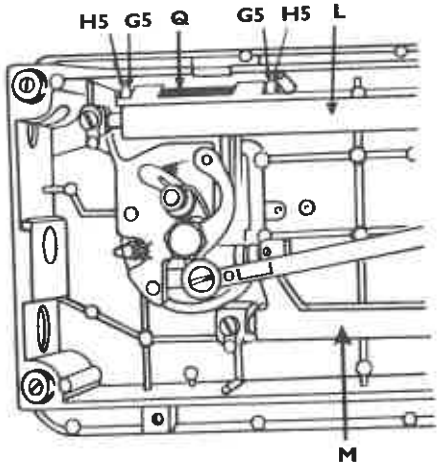


Figure 33
Feed Bar Assembly

FEED BAR ASSEMBLY

REMOVAL: (See Fig. 33)

1. Remove feed lifting rock shaft M and feed rock shaft L as instructed above.
2. Loosen nuts G5 and screw centres H5 and remove feed bar Q from feed rock shaft L.

REPLACEMENT AND ADJUSTMENT:

1. Install feed bar Q in reverse order of its removal. Tighten screw centres H5 equally upon feed bar Q so that feed bar rides freely on feed rock shaft L without any end play or binding. Then, while maintaining settings of screw centres H5, tighten nuts G5.
2. Install feed rock shaft assembly as instructed above.
3. Install feed lifting rock shaft as instructed on page 21.
4. Replace feed dog and adjust as instructed on pages 7 and 8.
5. Replace throat plate and bottom cover plate.

REMOVALS AND REPLACEMENTS

OSCILLATING HOOK AND BELL CRANK ASSEMBLY

REMOVAL:

1. Remove bottom cover plate, needle, presser foot, throat plate, bed slide, bobbin case and feed dog.

2. Remove hinge screw C5, Figs. 32 and 34, by turning screws clockwise, and release pitman rod J5.

3. Loosen set screw N1, Fig. 34.

4. Remove large hexagon head hinge screw K5 and remove bell crank assembly L5 as a unit.

5. Remove hexagon nut P1.

6. Remove oscillating hook, complete with position finger and cushion spring assembly.

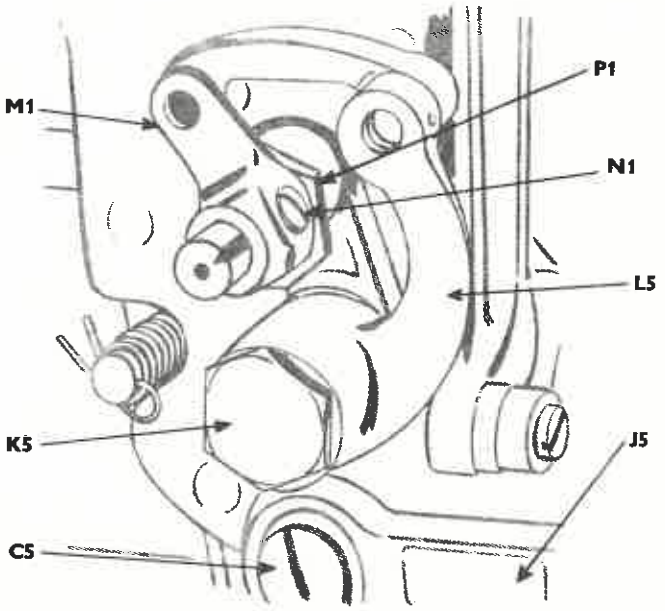


Figure 34
Oscillating Hook Crank Assembly

REPLACEMENT:

1. Replace oscillating hook assembly M5, Fig. 35, making certain that pilot of bracket screw is aligned with hole provided for it in bed casting, as shown by dotted lines in Fig. 35.

2. Replace hexagon nut P1, Fig. 34, and tighten firmly against bed casting.

3. Replace bell crank assembly L5 and securely tighten hexagon head hinge screw K5.

4. Align set screw N1 with timing groove of hook shaft; then, while pressing upon hook from top of machine, set crank M1 firmly against nut P1 and securely tighten screw N1.

5. Replace pitman rod J5 and securely tighten its two hinge screws C5, Figs. 32 and 34.

6. Replace bottom cover plate, feed dog, bobbin case, bed slide, throat plate, presser foot and needle.

7. Check oscillating hook timing (see page 15).

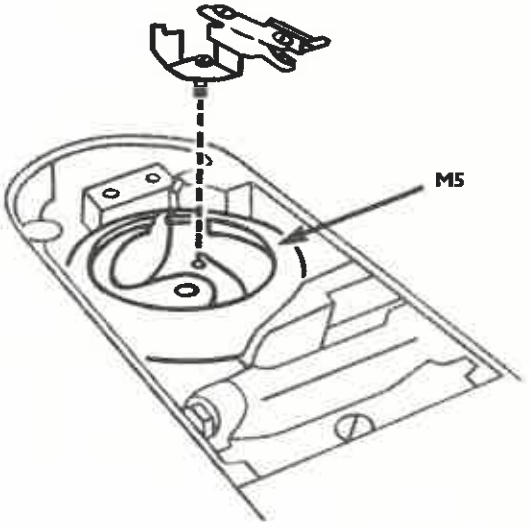


Figure 35
Replacing Hook

REMOVALS AND REPLACEMENTS

FEED LIFTING ROCK SHAFT CONNECTING ROD

REMOVAL:

1. Remove arm top cover and bed cover plate.

2. Remove cap screws U1, Fig. 36, and remove connecting rod cap.

3. Tilt machine back. Remove snap ring D5, Fig. 37, loosen set screw D and remove eccentric stud E, disengaging connecting rod from feed lifting rock shaft.

4. Remove connecting rod from bottom of machine.

REPLACEMENT:

1. Insert connecting rod into upright arm from bottom of machine, so that it fits around bottom half of gear hub W1, Fig. 36.

2. Replace cap over top half of gear hub and fasten cap to rod with two screws U1.

3. Replace eccentric stud E, Fig. 37, and snap ring D5, engaging connecting rod with feed lifting rock shaft.

4. Adjust feed dog height as instructed on page 8.

5. Replace arm top cover and bed cover plate.

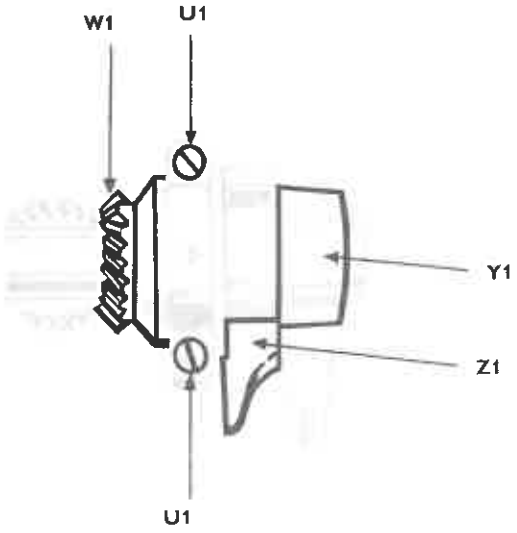


Figure 36
Feed Lifting Rock Shaft Connecting Rod and Feed Forked Connection

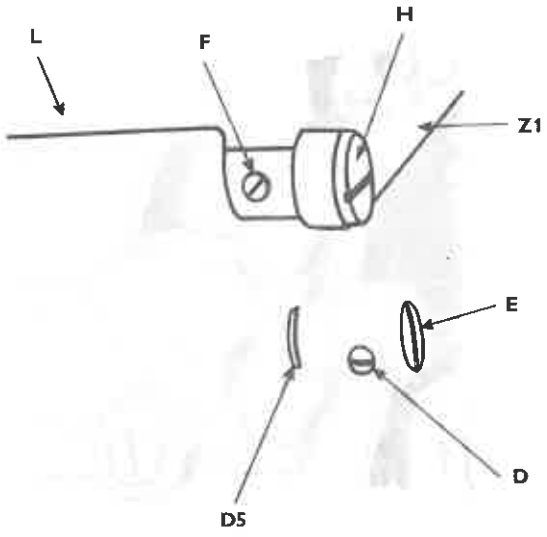


Figure 37
Connections Beneath Machine Bed

FEED FORKED CONNECTION

REMOVAL:

1. Remove arm top cover and bed cover plate.

2. Remove stitch length regulator as instructed on page 21.

3. Loosen set screw F, Fig. 37 and remove eccentric stud H disengaging feed forked connection Z1 from feed rock shaft L.

4. Remove feed forked connection Z1 from upright arm, through bottom of machine.

REPLACEMENT:

1. Insert feed forked connection Z1 into upright arm, from bottom of machine, so that it fits around feed eccentric Y1, as shown in Fig. 36.

2. Replace eccentric stud H, engaging feed forked connection with feed rock shaft. Tighten set screw F.

3. Replace stitch length regulator as instructed on page 21.

4. Set feed dog lengthwise as instructed on page 8.

5. Replace arm top cover and bed cover plate.

REMOVALS AND REPLACEMENTS

NEEDLE BAR

REMOVAL: (See Fig. 38)

1. Remove arm top cover and face plate.
2. Remove needle clamp.
3. Loosen screw H1 and lift needle bar out of machine.

REPLACEMENT:

1. Insert needle bar down through needle bar frame, as shown below.
2. Adjust needle bar height as instructed on page 11.
3. Securely tighten screw H1.
4. Replace needle clamp, arm top cover and face plate.

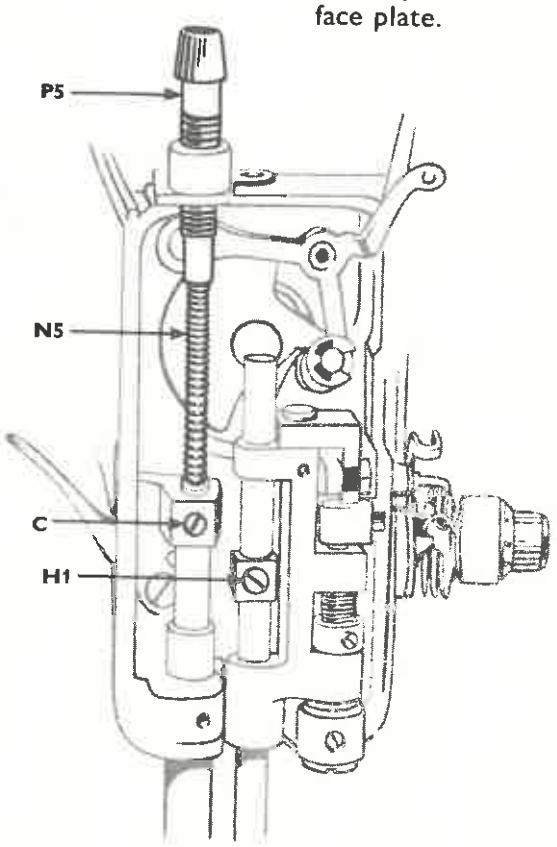


Figure 38
Needle Bar and Presser Bar Assembly

PRESSER BAR

REMOVAL: (See Fig. 38)

1. Remove face plate, presser foot and thumb screw.
2. Remove pressure regulating thumb screw P5.
3. Remove guide pin N5 with spring from top of machine.
4. Loosen screw C and remove presser bar from machine.

REPLACEMENT:

1. Replace presser bar assembly in the reverse order of its removal.
2. Replace presser foot on presser bar.
3. Adjust presser foot at correct height and align foot with slots for feed dog in throat plate, as instructed on page 6.
4. Then securely tighten screw C.

REMOVALS AND REPLACEMENTS
NEEDLE THREAD TAKE-UP ASSEMBLY

REMOVAL: (See Fig. 39)

1. Remove arm top cover and face plate.
2. Remove needle bar and presser bar (Steps 2 and 3 only) as instructed on page 25.
3. Loosen set screw Q5.
4. Through hole in top of casting, loosen set screw R5 in needle bar crank S5.
5. Withdraw needle thread take-up T5, with link U5 and hinge stud V5 from machine.

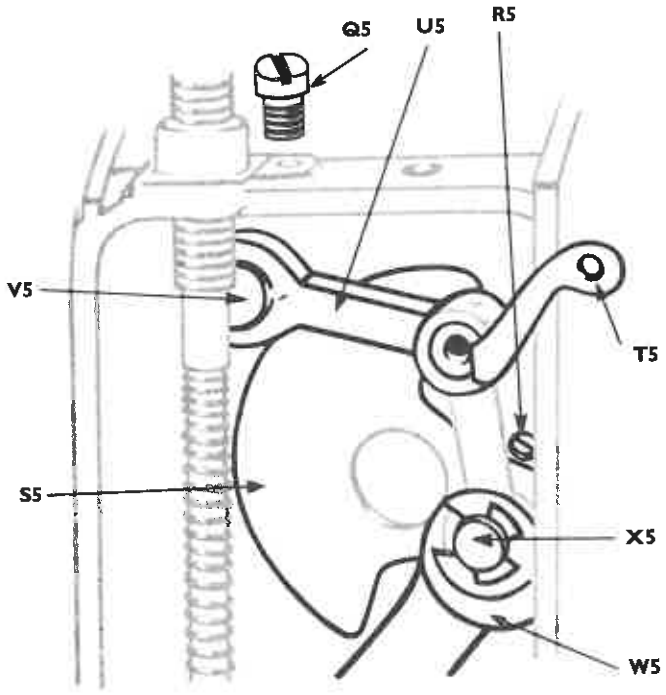


Figure 39
Needle Thread Take-up Assembly

REPLACEMENT:

1. Replace needle thread take-up in reverse order of its removal.

IMPORTANT: When replacing take-up assembly, make certain that set screw R5 is tightened firmly against flat on take-up hinge stud X5. Then, while turning hand wheel over toward you, slowly tighten set screw Q5.

2. Replace presser bar guide pin, spring and pressure regulating thumb screw.
3. Replace arm top cover and face plate.

REMOVALS AND REPLACEMENTS

HORIZONTAL ARM SHAFT

REMOVAL: (See Fig. 40)

1. Remove arm top cover and face plate.
2. Remove needle bar and presser bar (Steps 1, 2 and 3 only) as instructed on page 25.
3. Remove needle bar rocker bracket assembly as instructed on page 33.
4. Remove needle thread take-up as instructed on page 26.
5. Remove hand wheel and flanged bushing assembly as instructed on page 20.
6. Loosen screw S1 in collar T1.
7. Remove screws U1 and remove connecting rod cap.
8. Loosen screws Y5 in arm shaft worm gear Z5.
9. Loosen timing screws V1 and X1 so that gear W1 and eccentric Y1 are free on arm shaft.

   NOTE: Keep gears in mesh at all times.

10. Remove arm shaft out of face plate-end of machine. Hold gear W1 in mesh with gear at top of upright shaft.

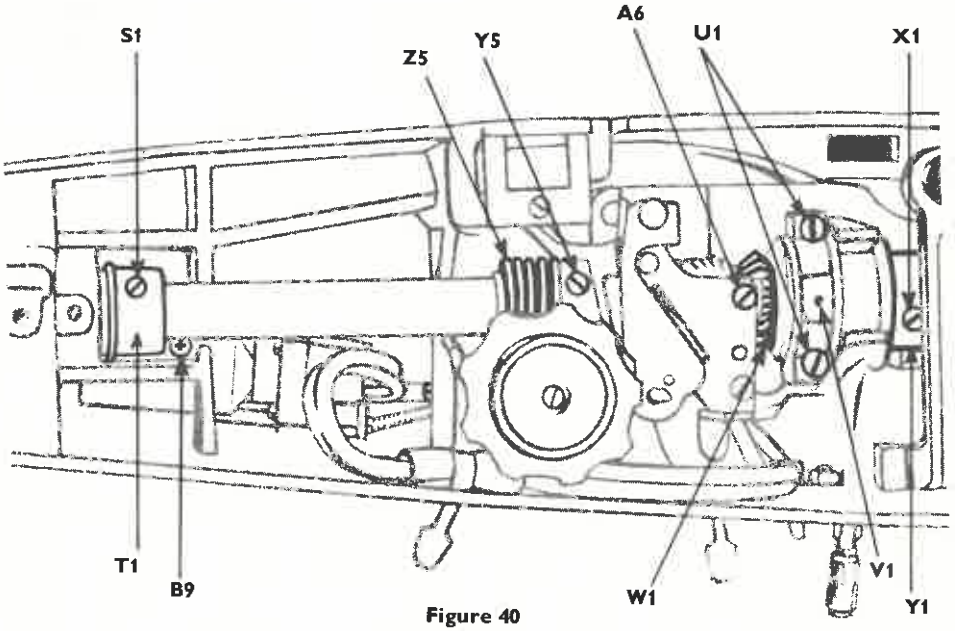


Figure 40
Horizontal Arm Shaft

REPLACEMENT:

1. From face plate-end of machine insert new arm shaft into machine arm, through collar T1, worm gear Z5, bevel gear W1 and feed eccentric Y1.
2. Make certain that flat on arm shaft is under set screw S1, then, while pressing firmly on needle bar crank and holding collar T1 against casting, tighten set screw S1.
3. Set gear W1 firmly in mesh with gear at top of upright shaft and tighten screw V1 against timing groove of arm shaft.
4. Set feed eccentric Y1 gently against feed forked connection and tighten screw X1 against timing groove of arm shaft.
5. Replace connecting rod cap and fasten with screws U1.
6. Replace flanged bushing assembly and hand wheel assembly as instructed on page 20.
7. Replace needle thread take-up as instructed on page 26.
8. Replace needle bar rocker bracket assembly and presser bar as instructed on page 33.
9. Replace needle bar and presser bar assembly as instructed on page 25.
10. Time needle bar vibrating mechanisms as instructed on pages 28, 29, 30 and 33.
11. Replace arm top cover and face plate.

TO SET THE POSITION OF THE NEEDLE TO OR FROM THE HOOK POINT

PREPARATION:

1. Set needle bar at correct height as instructed on page 11.

2. Set needle position lever at "C" and stitch width lever at "O".

3. Remove presser foot, throat plate, bobbin case and feed dog.

4. Insert a size #18 needle into needle clamp.

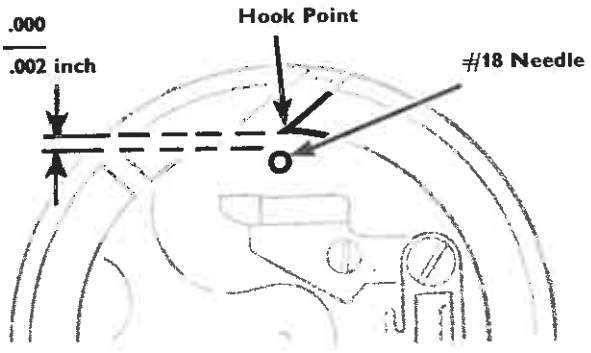


Figure 41
Correct Position of Needle (Viewed from Above)

CHECK:

Turn hand wheel over toward you until point of hook is directly behind needle.

Distance between needle and hook point should be .000 to .002 inch, as shown in Fig. 41. (Use Feeler Gauge to check this distance.)

SETTING:

1. Loosen screws B6 and C6, Fig. 42.

2. Loosen set screw D6 in collar E6.

3. Using offset screwdriver, turn eccentric stud F6, left or right, as required, to bring needle between .000 and .002 inch from point of hook.

4. When correct setting is obtained (.000 to .002 inch), tighten screws B6 and C6.

5. Turn collar E6 counter-clockwise until sufficient spring tension is obtained. Then tighten collar set screw D6.

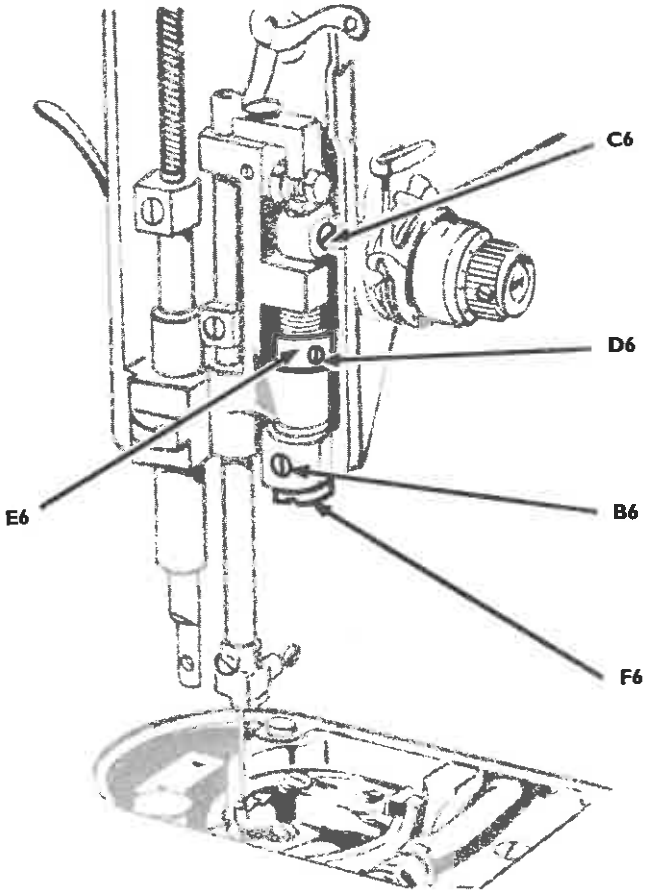


Figure 42
Setting Position of Needle to or from Hook Point

TO CENTRALISE THE NEEDLE IN NEEDLE HOLE IN STRAIGHT-STITCHING THROAT PLATE

PREPARATION:

1. Remove presser foot, arm top cover, face plate. Lower light, loosen screw B9 (Fig. 40) and remove light shield.

2. Install straight-stitching throat plate.

3. Insert a size #11 needle up into needle clamp.

4. Place Disc No. 1 (Zigzag) on disc spindle.

5. Set needle position selector at "C" and stitch width lever at "O".

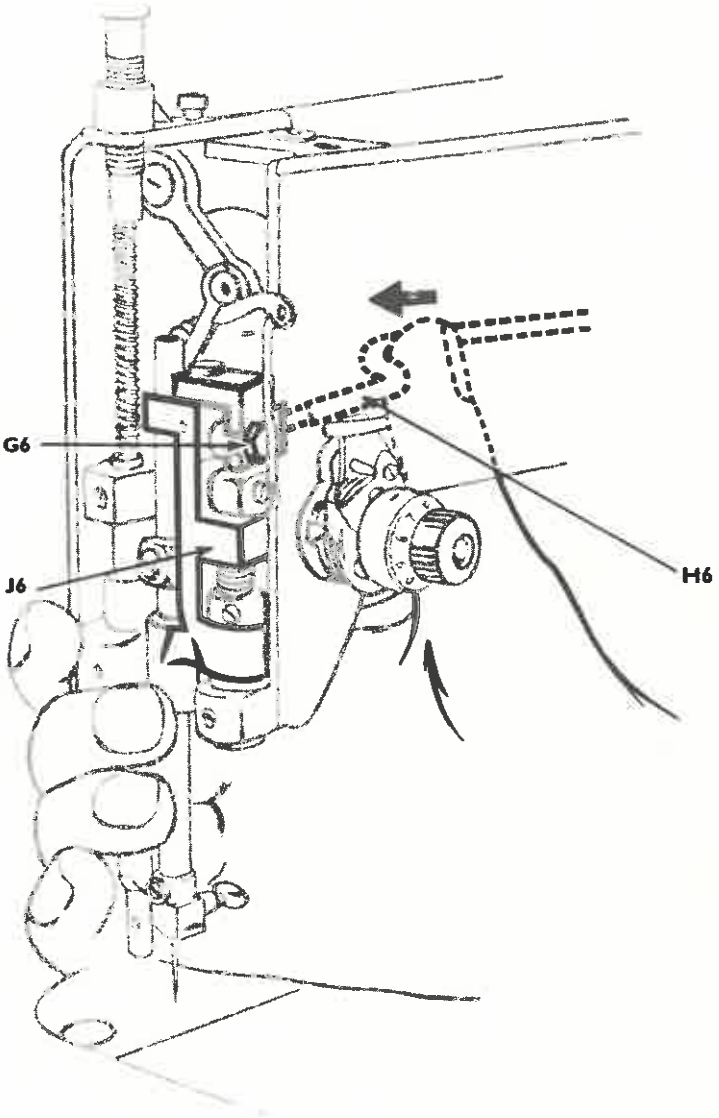


Figure 43
Centralising Needle

CHECK:

Turn hand wheel over toward you until point of needle enters hole of throat plate. Point of needle (Size #11) should be located in centre of needle hole.

SETTING: (See Fig. 43.)

1. Loosen hexagon screw G6 (Use 1/4 inch wrench.)

2. With thumb of right hand, press driving arm H6 firmly toward face plate end of machine, and at same time, press needle bar rocker bracket assembly J6 toward hand wheel end until point of needle is located directly at centre of throat plate needle hole.

3. When correct needle position is obtained securely tighten hexagon screw G6.

4. Replace presser foot, arm top cover, and face plate.

5. Push light back into position.

TO TIME THE PENDULUM MOVEMENT OF THE NEEDLE BAR

PREPARATION:

1. Remove arm top cover.
2. Insert general purpose throat plate.
3. Place Disc No. 1 (Zigzag) on disc spindle.
4. Set needle position selector at "C" and stitch width lever at "4".

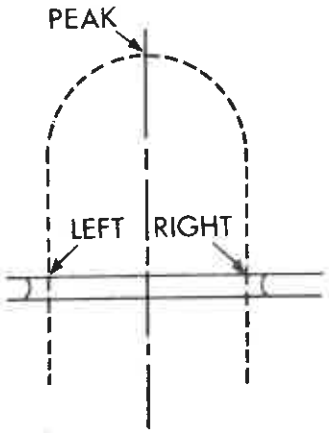


Figure 44
Correct Pendulum Movement

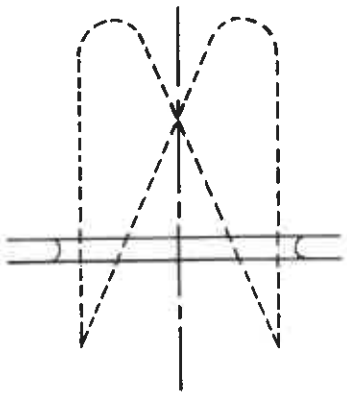


Figure 45
Incorrect Pendulum Movement

CHECK:

While slowly turning hand wheel over toward you, observe movement of needle bar.

Needle should begin and end its pendulum movement at about same height above throat plate, as shown in Fig. 44. Needle should reach its peak of ascent midway between two extreme positions of needle.

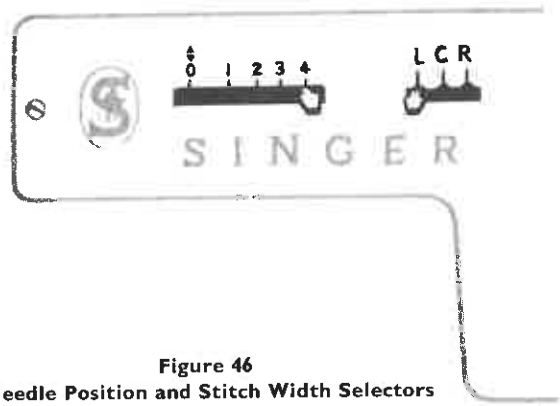


Figure 46
Needle Position and Stitch Width Selectors

SETTING:

1. Centralise needle in needle hole of straight-stitching throat plate as instructed on page 29.
2. Set needle position selector at "L" as shown in Fig. 46.
3. Loosen two set screws Y5 in worm gear Z5, Fig. 47.
4. Turn hand wheel over toward you until needle bar is at its lowest point in LEFT position.
5. Turn disc as required to locate follower L6 at centre of low point of Zigzag disc as shown in Fig. 47.
6. Tighten one of set screws Y5.

   NOTE: If set screws Y5 can not be reached, turn worm gear Z5 until a set screw becomes accessible.

7. Re-check pendulum movement. If satisfactory, tighten other set screw Y5.
8. Replace arm top cover.

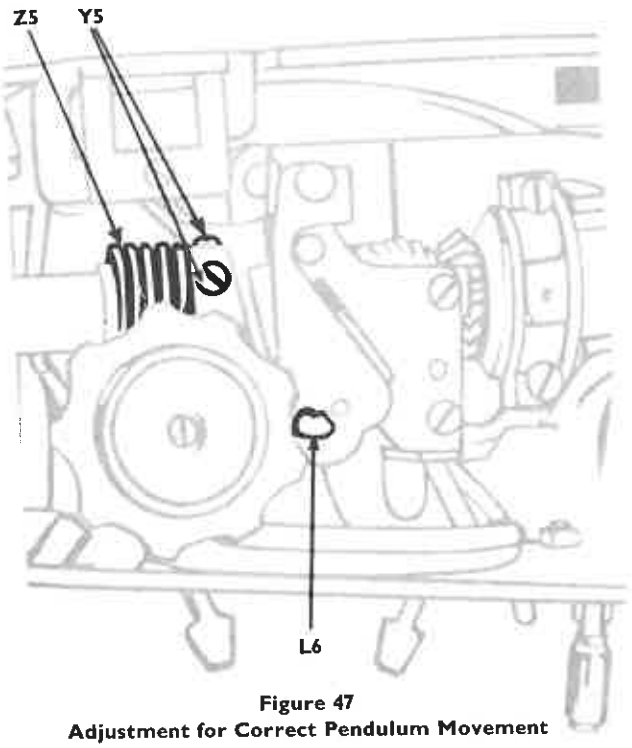


Figure 47
Adjustment for Correct Pendulum Movement

TO ADJUST NEEDLE POSITION SELECTOR BRACKET ASSEMBLY

PREPARATION:

1. Remove arm top cover.
2. Insert general purpose throat plate.
3. Insert a size #9 needle up into needle clamp.
4. Place Disc No. 1 (Zigzag) on disc spindle.
5. Set needle position selector at "L".
6. Set stitch width lever at 4.
7. Turn hand wheel over toward you until needle bar is at its lowest point in LEFT position.

CHECK:

Move stitch width lever from left to right. While doing so, there should be a minimum movement in needle bar.

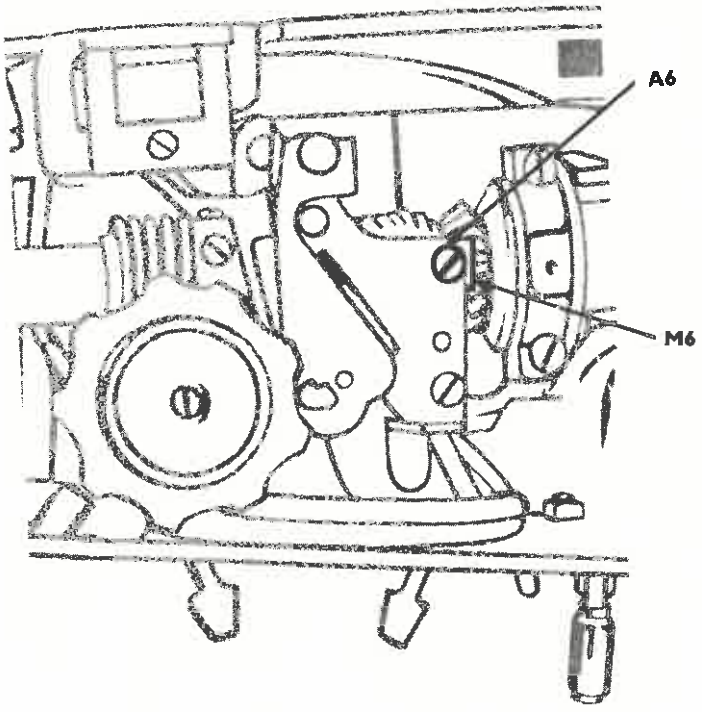


Figure 47a

Adjusting Needle Position Selector Bracket

SETTING: (See Fig. 47a)

1. Set stitch width lever at "4".
2. Loosen bracket screw A6.
3. Turn hand wheel over toward you until needle bar is at its lowest point in LEFT position.
4. Move stitch width lever slowly from "1" to "4" and, at same time, move selector bracket extension M6 toward left or right as required, until there is minimum movement in needle bar.
5. Tighten bracket screw A6.

CHECK:

Place a sheet of note paper over throat plate. Set stitch width lever at "4" and needle position selector at "L". With needle in LEFT position, lower and raise needle to make a slight perforation in the paper. Repeat this operation at settings of "0", "1", "2" and "3" with needle remaining in LEFT position.

At correct adjustment of selector bracket M6, the needle will always enter the same perforation in paper.

TO ADJUST THE CAM STACK

PREPARATION:

1. Remove arm top cover.

2. Set needle position selector at "C" and stitch width lever at "O".

CHECK:

Check for excessive end play or binding between arm shaft worm gear N6 and disc driving gear P6.

SETTING:

1. Remove stitch width indicator plate as instructed on page 13.

2. Loosen cam stack set screw Q6.

3. Insert screwdriver in slot of disc spindle R6 and turn spindle counter clockwise to bring high point of eccentric toward arm shaft worm gear. Then "back-off" until there is no binding and a minimum amount of backlash.

4. Tighten set screw Q6.

5. Replace indicator plate.

IMPORTANT: Adjust stitch width lever for maximum width of zigzag stitch as follows:

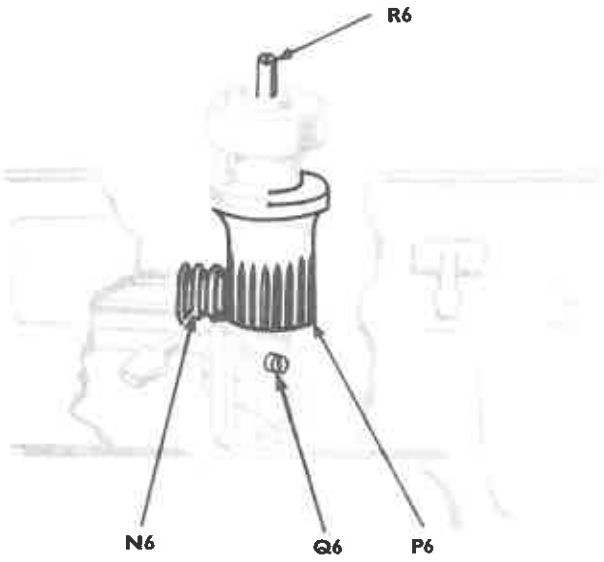


Figure 48
Cam Stack Adjustment

(1) Set stitch width lever at "4".

(2) Loosen screw stud S6, Fig. 49.

(3) Press needle bar driving arm H6 toward you (away from arm shaft) and at same time tighten screw stud S6.

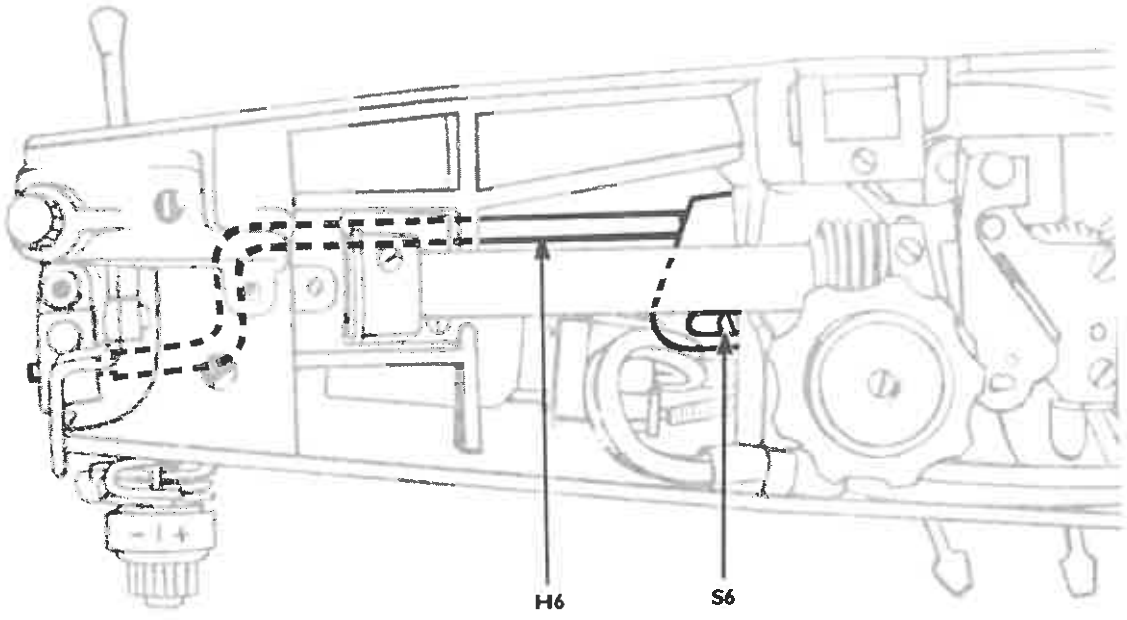


Figure 49
Stitch Width Lever Adjustment

REMOVALS AND REPLACEMENTS
NEEDLE BAR ROCKER BRACKET ASSEMBLY

REMOVALS: (See Fig. 50)

1. Remove needle and face plate.
2. Loosen set screw S6 and remove hinge pin T6.
3. Loosen set screws B6 and C6.
4. Loosen set screw D6 in collar E6 and remove eccentric stud F6.
5. Remove needle bar frame J6 together with needle bar.
6. Then loosen clamping screw H1 and remove needle bar from needle bar frame J6.

REPLACEMENT:

1. Replace needle bar frame in reverse order of its removal.

   NOTE: Before replacing eccentric stud F6 make certain that spacing washer U6 is in place as shown in Fig. 50.

2. Set needle bar at correct height as instructed on page 11 and adjust needle to or from hook point as instructed on page 28.

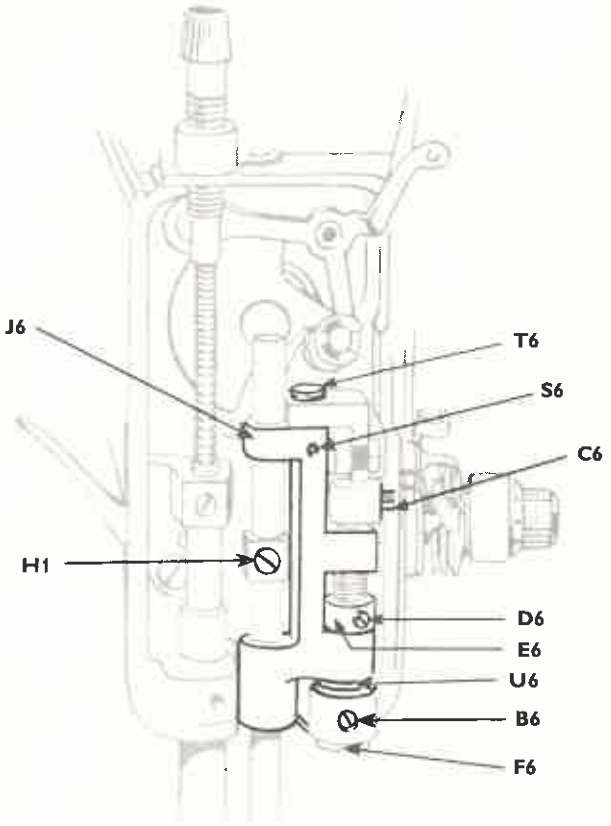


Figure 50
Needle Bar Rocker Bracket Assembly

CAM STACK AND STITCH WIDTH LEVER ASSEMBLY

REMOVAL: (See Fig. 51)

1. Remove arm top cover.
2. Remove indicator plate.
3. Remove two screws A8 and arm side cover B8, Fig. 24a.
4. Remove circlip W6.
5. Loosen set screw Q6.
6. Lift entire cam stack assembly from machine arm.
7. Slide stitch width lever X6 from fork of driving arm H6 and remove lever assembly from machine arm.

REPLACEMENTS:

1. Replace cam stack assembly in machine arm.
2. Insert stitch width lever assembly into cutout in front of arm and fit stud S6 in fork of driving arm H6, as shown in Fig. 51.
3. Align hole in lever spring with cam stack shaft and, from bottom of arm, replace circlip W6. Make certain that lever assembly is properly seated on shaft then replace circlip W6.

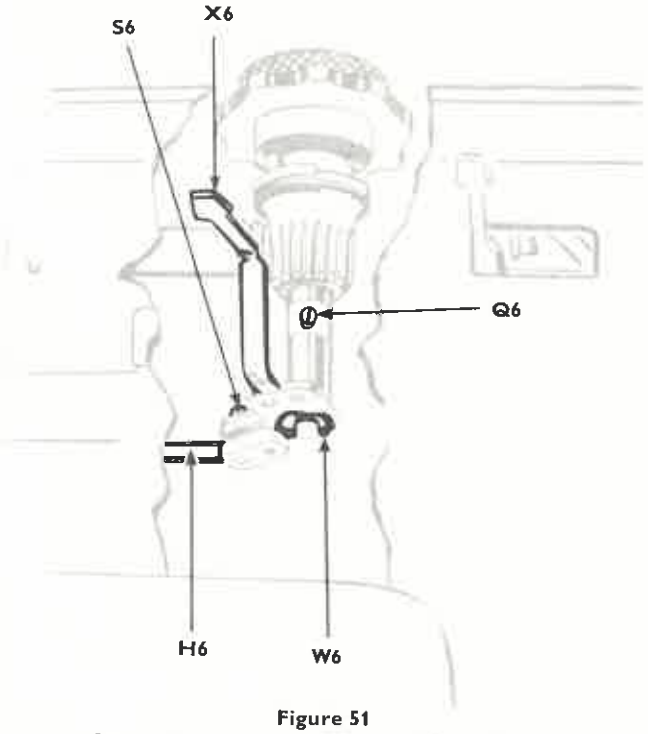


Figure 51
Cam Stack and Stitch Width Lever Assembly

REMOVALS AND REPLACEMENTS

NEEDLE POSITION SELECTOR LEVER ASSEMBLY AND NEEDLE BAR DRIVING ARM

REMOVAL:

1. Remove arm top cover.

2. Remove indicator plate as instructed on page 13.

3. Remove arm side cover (See page 33).

4. Remove cam stack assembly as instructed on page 33.

5. Loosen screw D6, Fig. 42, remove screw A6, Fig. 52, push bracket G7 counter clockwise and slide needle position lever A7 with its spring toward right and then out of machine.

6. Lift out hinge pin B7 disengaging bracket C7 from pin D7.

7. Loosen set screw S6, Fig. 53, and remove hinge pin T6, disengaging block E7 from needle bar rocker assembly.

NOTE: It is not necessary to remove hexagon head screw G6 from driving arm.

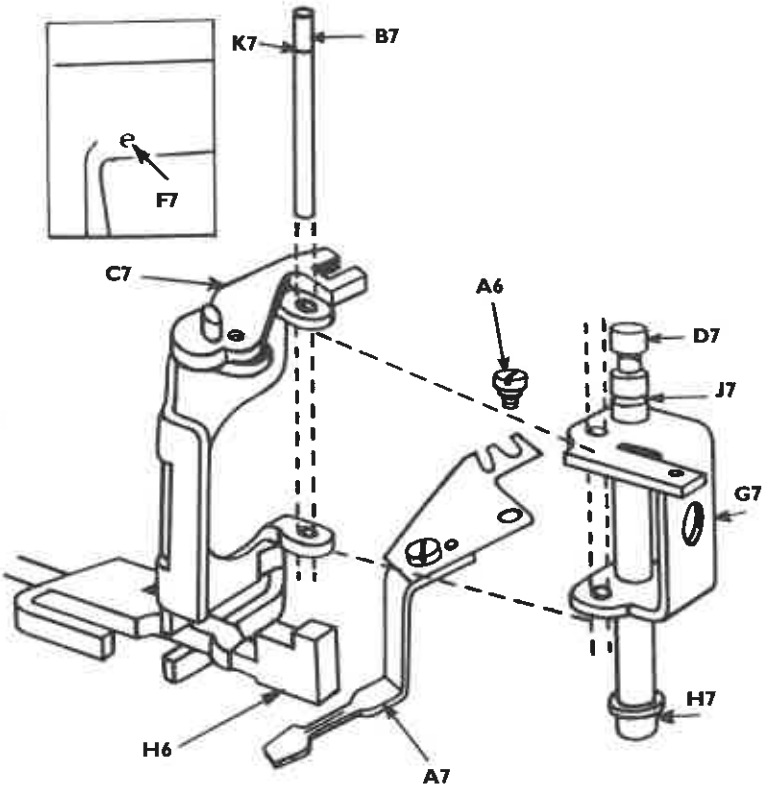


Figure 52
Needle Position Selector Lever and Bracket Assembly

8. Move selector bracket assembly C7, Fig. 52. and driving arm H6, Fig. 53, as required, until the latter becomes disengaged from long slot of selector bracket assembly.

9. Slide driving arm toward left and out of machine from face plate end.

10. Remove selector bracket assembly C7, from machine.

11. Loosen set screw F7, at back of arm, Fig. 52 (inset), and remove pin D7 with its bracket G7 and spacing collar H7, from machine, as shown in Fig. 52.

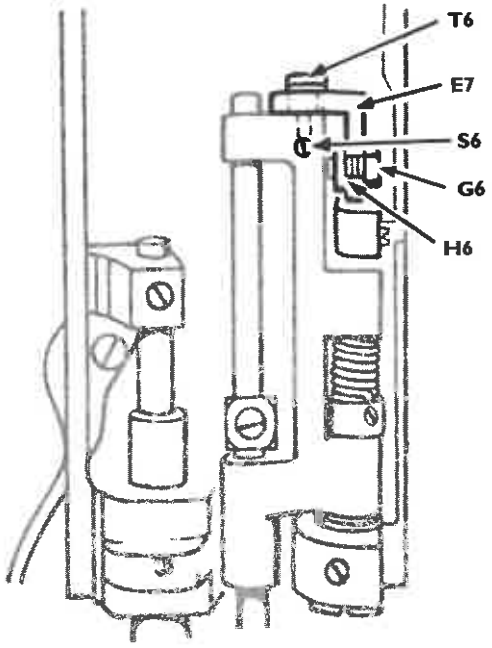


Figure 53
Removing Needle Bar Driving Arm

REPLACEMENT:

Replace needle position selector lever assembly and needle bar driving arm in the reverse order of their removal. Observe the following.

REMOVALS AND REPLACEMENTS

NEEDLE POSITION SELECTOR LEVER ASSEMBLY AND NEEDLE BAR DRIVING ARM

1. Fit bracket G7 and collar H7 on pin D7 and assemble to machine arm. Do not tighten set screw F7.

2. Replace selector bracket assembly C7.

3. Insert driving arm H6, from face plate end, into machine arm and fit right end of arm on fork of selector bracket assembly, as shown in Fig. 52.

4. Insert Pin B7 through holes provided for it in brackets C7 and G7.

5. Replace needle position lever assembly A7, fitting large fork in groove J7 of pin D7 and small fork in groove K7 of pin B7.

6. Press pin D7 down and tighten set screw F7.

7. Replace and tighten screw A6.

8. Replace hinge pin T6, Fig. 53, and tighten set screw S6.

9. Tighten screw D6, Fig. 50.

10. Replace cam stack and stitch width lever assembly as instructed on page 33.

11. Replace indicator plate.

12. Time machine as instructed on pages 28-32.

DUAL PURPOSE HANDWHEEL
TREADLE/ELECTRIC MACHINE

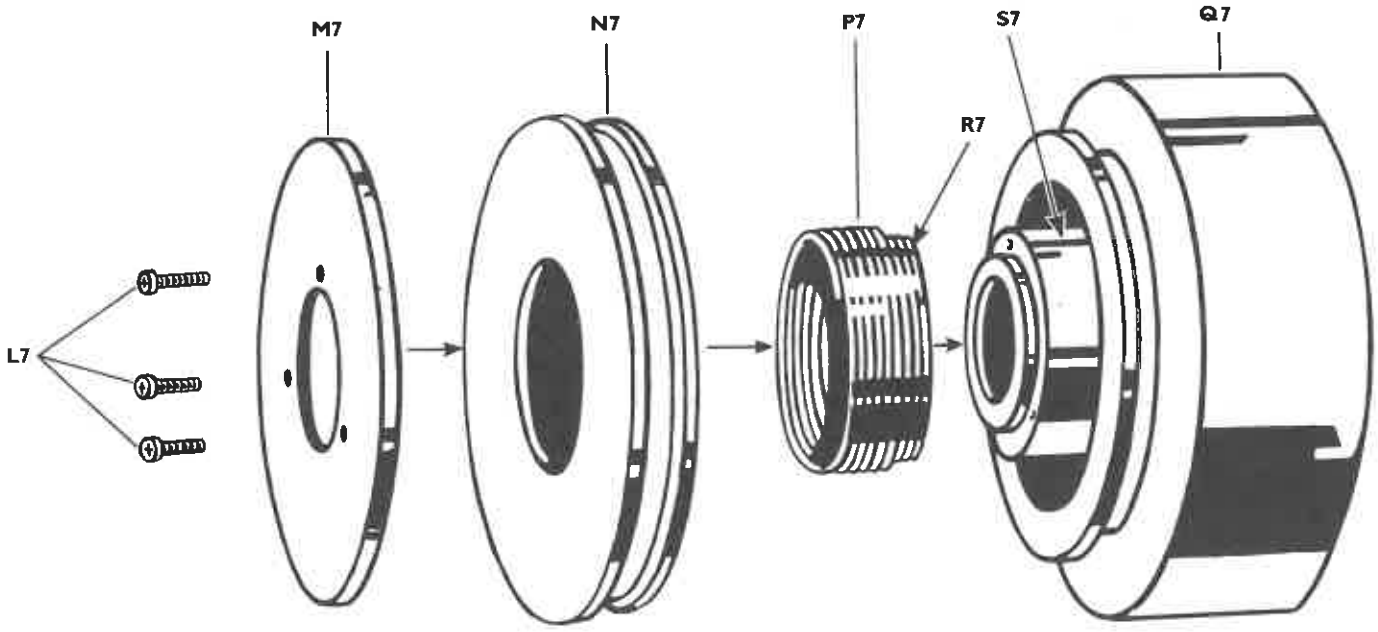


Figure 54
Dual Purpose Handwheel

REMOVAL:

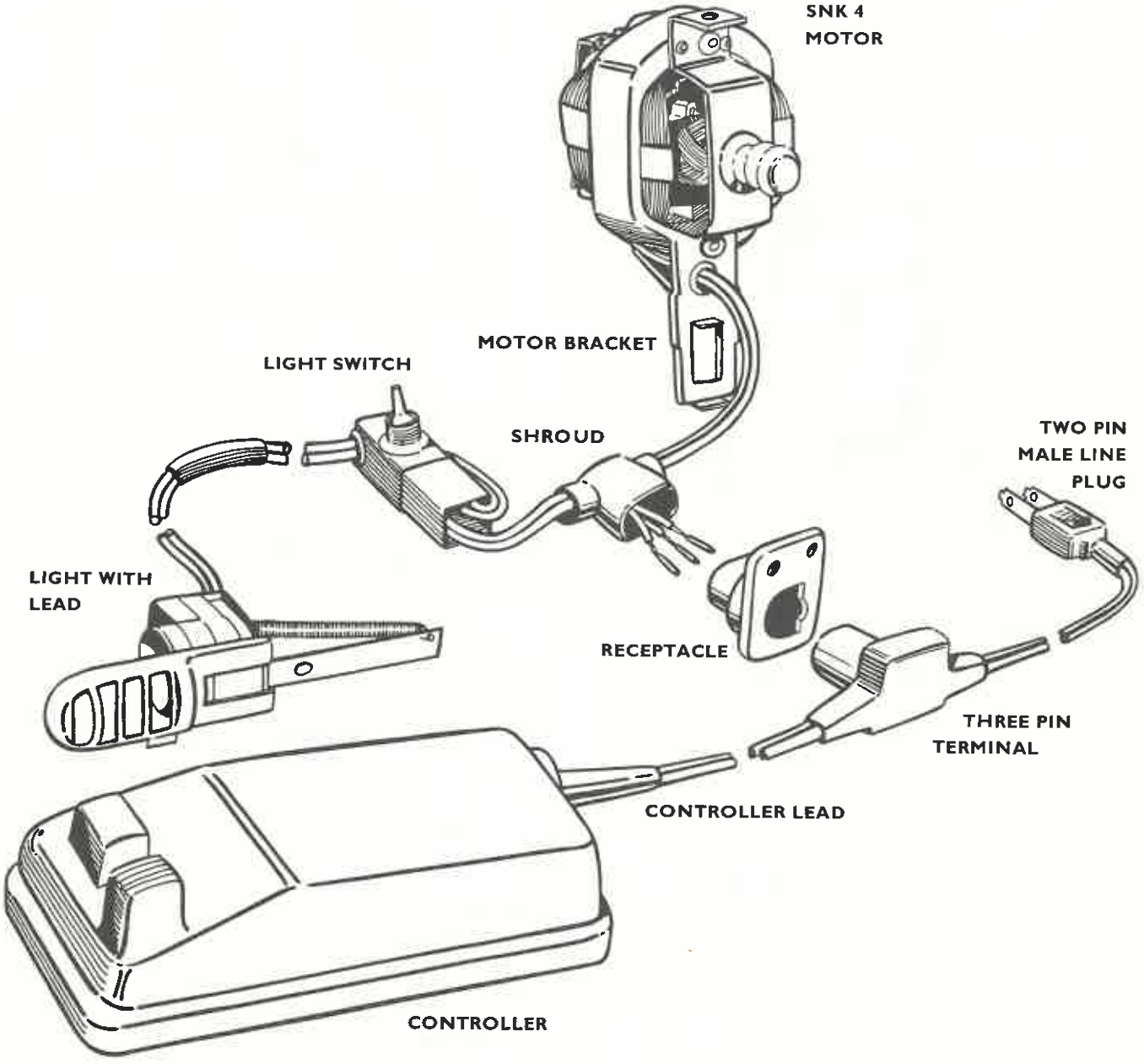
1. Remove arm end cover and disengage motor belt from motor pulley and treadle belt from band wheel.
2. Remove Screw A3 from stop motion screw B3 (Fig. 30).
3. Remove screw B3, Washer C3 and hand wheel from arm shaft. Disengage treadle belt and motor belt while removing hand wheel (Fig. 30).
4. Remove screw E3 and flanged bushing D3 from arm shaft (Fig. 30).
5. Remove three screws L7 (Fig. 54).
6. Remove plate M7 (Fig. 54).
7. Remove motor pulley N7 by turning in counter-clockwise direction as it is withdrawn from the assembly.
8. Remove spring P7, turning in counter-clockwise direction as it is withdrawn from treadle hand wheel Q7.

REPLACEMENT:

1. Replace spring P7 locating reduced diameter R7 against the boss S7 of treadle hand wheel Q7. Assemble by pushing in direction shown simultaneously turning spring in counter-clockwise direction.
2. Replace motor hand wheel locating bore on boss of treadle hand wheel. Assemble by pushing in direction shown simultaneously turning motor hand wheel in counter-clockwise direction.
3. Replace plate M7 and screws L7.
4. Replace hand wheel assembly locating motor and treadle belts in their respective grooves.

WIRING DIAGRAM

MACHINE 338



ELECTRIC AND TREADLE INFORMATION
TO CONVERT MACHINES 337 AND 338
FROM ELECTRIC TO TREADLE DRIVE

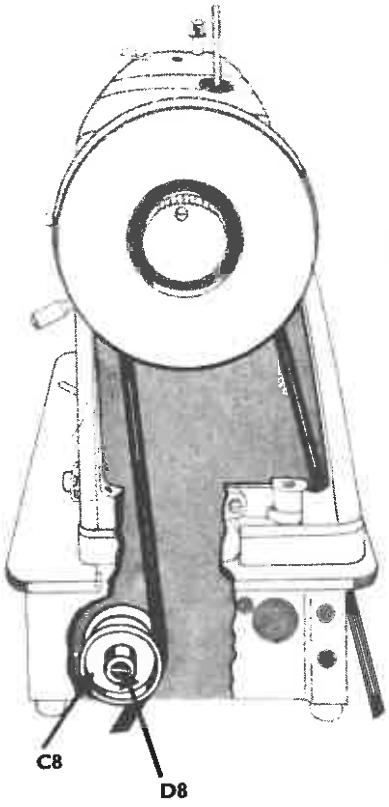


Figure 55
Inserting Belt in Machine Head

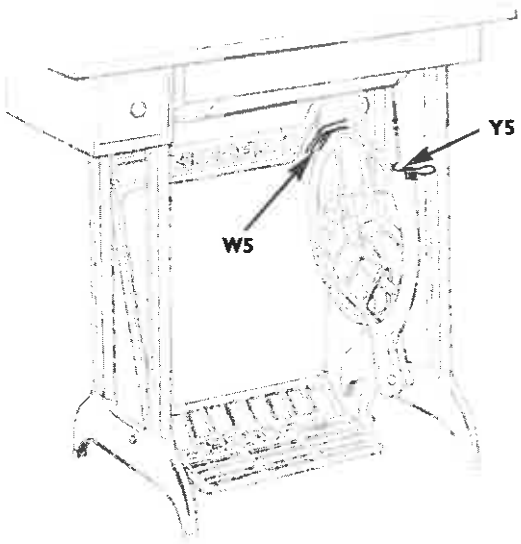


Figure 56
Belt Around Band Wheel.
Machine Converted to Treadle Drive

1. Remove arm top cover and arm end cover.

2. Loosen stop screw A3, Fig. 57, unscrew clamp nut B3, then remove washer, hand wheel and motor belt.

3. Replace with hand wheel for treadle drive. Replace washer C3, clamp screw B3 and stop screw A3 (See Fig. 57).

4. Remove motor as instructed on page 16.

5. Fix idler pulley C8 to machine bed by means of fastening screw D8.

6. Insert end of belt up so that it enters belt groove in hand wheel.

7. Lead belt around hand wheel and down through casting ensuring that side of belt is on the inside of idler pulley (See Fig. 55).

   NOTE: Belt ends will lead out from base of machine.

8. Replace arm end cover as instructed on page 16.

9. Next, lead belt through guide W5, then around band wheel and up into eye of belt shifter Y5 (See Fig. 56).

10. Join ends of belt.

    NOTE: Tension on belt should be only heavy enough to keep belt from slipping.

11. Replace arm top cover and arm end cover.

TO CONVERT MACHINES 337K, 338K AND 339K FROM TREADLE TO ELECTRIC DRIVE

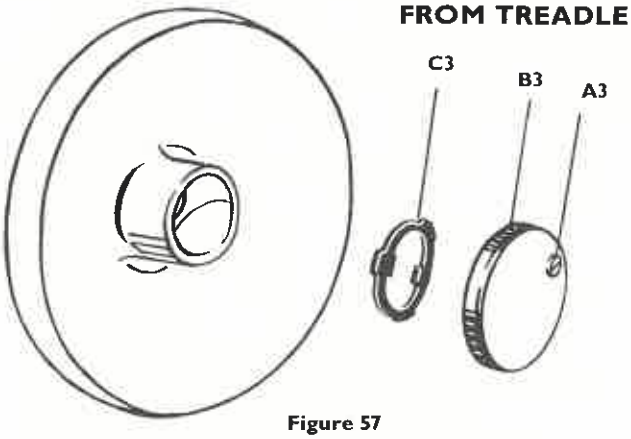


Figure 57
Hand Wheel Assembly

1. Remove 2 screws T7 and arm end cover D2. (Fig. 23a).
2. Remove Electrical Data Plate from end cover, using a sharp instrument, taking care not to damage the paint.
3. Remove backing paper from replacement data plate and press data plate firmly into the rectangular indent on the end cover.
4. Remove belt clip from treadle belt, freeing both ends and remove belt from machine.
5. Remove screw E2, receptacle and shroud assembly F2.
6. Ease shroud along lead until it clears receptacle, H2—Fig. 23b.
7. Remove pins L2, using tool G4—Fig. 23c, pushing the removal tool firmly in the direction indicated.
8. Cut one of the light switch leads at the pin and bare the end of this lead to the same length as the bared end of the motor lead.
9. Loosen stop screw A3, Fig. 57, unscrew clamp screw B3, then remove washer C3 and hand wheel.
10. Remove arm top cover.
11. Install motor post pin N2 and screw M2 into machine.
12. Install motor into machine arm and lower bracket post pin N2 through upper motor bracket P2, then tighten screw M2.
13. With screw Q2 and bushing R2 assembled to slot of lower motor bracket, fit bushing S2 on adjuster R2 and fasten entire assembly to machine.

    NOTE: Do not tighten screw Q2 until final adjustment is made (See step No. 20).
14. Thread leads through shroud G2, (Fig. 23b), ensuring that both light switch leads are led into the left opening and both motor leads into the right opening.

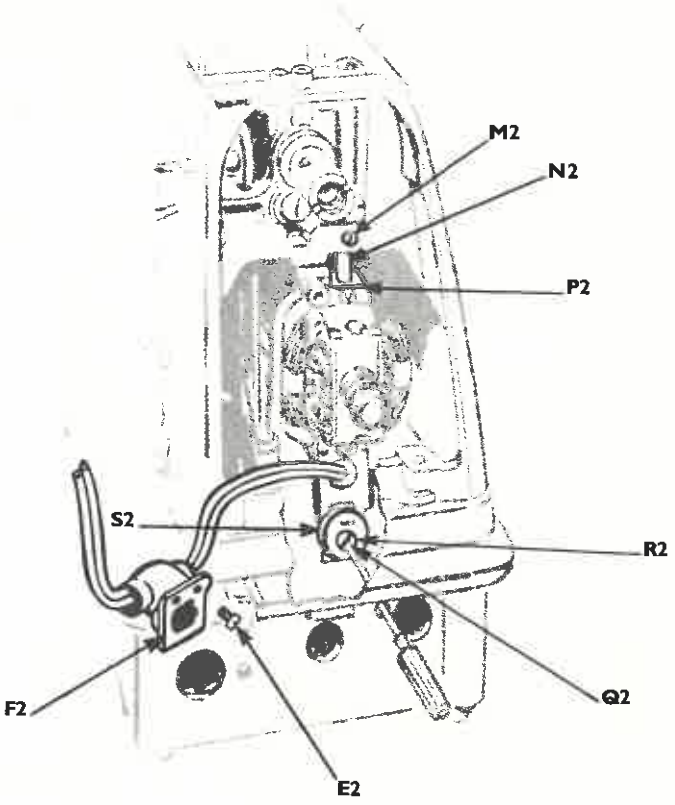


Figure 58
Motor Connection

15. Twist bared ends of both leads together and insert into the replacement pin. Crimp the pin to the leads by using the crimping tool.

    NOTE: In the absence of a crimping tool, these leads may be soldered into the pin. Ensure that all excess solder is removed from the outside of the pin before re-inserting into the receptacle.
16. Replace pins into the appropriate receptacle, taking care that the pins are inserted into their correct holes. (See Figs. 23b and 23c—Page 17).
17. Replace shroud and reassemble receptacle and shroud into machine.
18. Replace hand wheel for electric drive (with motor belt in belt groove). Replace washer C3, clamp screw B3, and stop screw A3 (See Fig. 30, page 20).
19. Raise motor and guide belt around motor pulley.
20. Turn adjuster R2 to adjust belt tension. Then tighten bracket screw Q2.
21. Replace arm end cover.
22. Replace arm top cover.

SINGER
SEWING MACHINES
CLASS 337

The instructions on pages 6 to 39 generally apply to Class 337.

Specific instructions which apply only to Machines of Class 337 are on pages 40 to 44.

For detailed information concerning operation, threading, choice of needles, etc., see instruction book.

Machine 337—Form K6644 (for U.S.A. and Canada) and K6645 (other than U.S.A. and Canada).

DESCRIPTION

Machine 337

For straight and zigzag stitching.

Flat bed aluminium machine.

Foot power (Machine 337/1) with built-in light.

Electric power (Machine 337/3) with built-in SNK4 (double insulated) motor and light (hinged).

Dual purpose foot power or electric drive (Machine 337/4).

Horizontal oscillating hook on a vertical axis, with stationary bobbin case, located in front of needle.

Movable bobbin case cushion spring for easy removal of bobbin case.

Throat Plate held in position by a position pin and spring loaded clamp for easy removal.

Bight control lever on front of arm in direct view of the operator. The lever controls the width of the zigzag stitch up to a maximum of 4 mm. When the machine is to be used for straight sewing this lever is placed in the zero "0" position on the bight indicator of the control panel.

Lock stitch, drop feed, link take up.

The feed regulator lever can be adjusted for fine regulation of the short stitch in the satin stitch area above 20, and a notch is provided in the stitch indicator backing plate for positive long stitch.

Control Panel. This panel contains the trademark, machine class number, stitch graduations and indications for bight control lever.

Numerically graduated thread tension device.

Reversible feed, adjustable.

Semi-automatic bobbin winder, partially enclosed in arm adjacent to hand wheel.

Bed—16-1/2 inches long—7 inches wide.

Working space at right of needle—7-1/8 inches.

Needle Catalogue 2020 (15 x 1)—thread from front to back.

Maximum stitch length—6 per inch.

Needle bar stroke—1·183 inches.

Presser bar lift—·290 to ·300 inches.

Maximum width of zigzag stitch (bight approximately 5/32 inch) 4 mm.

Maximum speed at the rated voltage not less than 900 r.p.m.

TO TIME THE PENDULUM MOVEMENT OF THE NEEDLE BAR

PREPARATION:

1. Remove arm top cover.
2. Insert general purpose throat plate.
3. Set stitch width lever at "4".

CHECK:

While slowly turning hand wheel over toward you, observe movement of needle bar.

Needle should begin and end its pendulum movement at about same height above throat plate, as shown in Fig. 59.

Needle should reach its peak of ascent mid-way between two extreme positions of needle.

SETTING:

1. Insert straight stitch throat plate.
2. Insert a size No. 11 needle up into needle clamp.
3. Set stitch width lever at "0".
4. Centralize needle in needle hole of straight stitch throat plate as per setting instructions on page 29.
5. Loosen two set screws Y5 in worm gear Z5, Fig. 62.
6. Turn hand wheel over toward you until needle bar is at its lowest point.
7. Turn disc as required to locate follower L6 at centre of low point of Zigzag Disc as shown in Fig. 62.
8. Tighten one of set screws Y5.

   NOTE: If set screw Y5 can not be reached, turn worm gear Z5 until a set screw becomes accessible.
9. Insert general purpose throat plate and re-check pendulum movement. If satisfactory, tighten other set screw Y5.
10. Replace arm top cover.

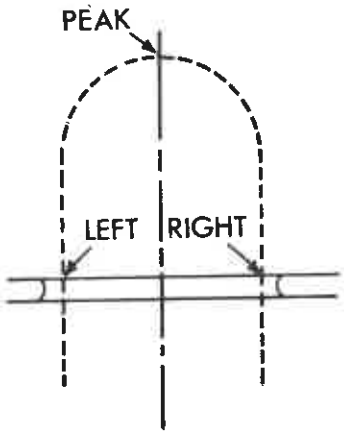


Figure 59
Correct Pendulum Movement

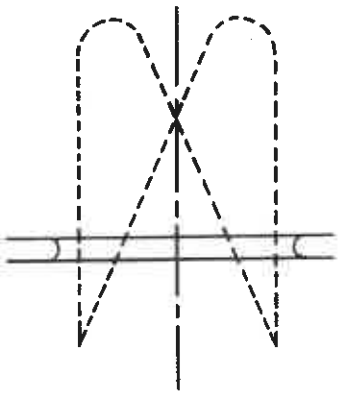


Figure 60
Incorrect Pendulum Movement

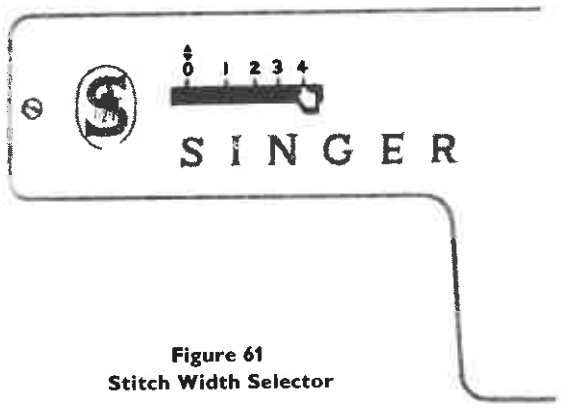


Figure 61
Stitch Width Selector

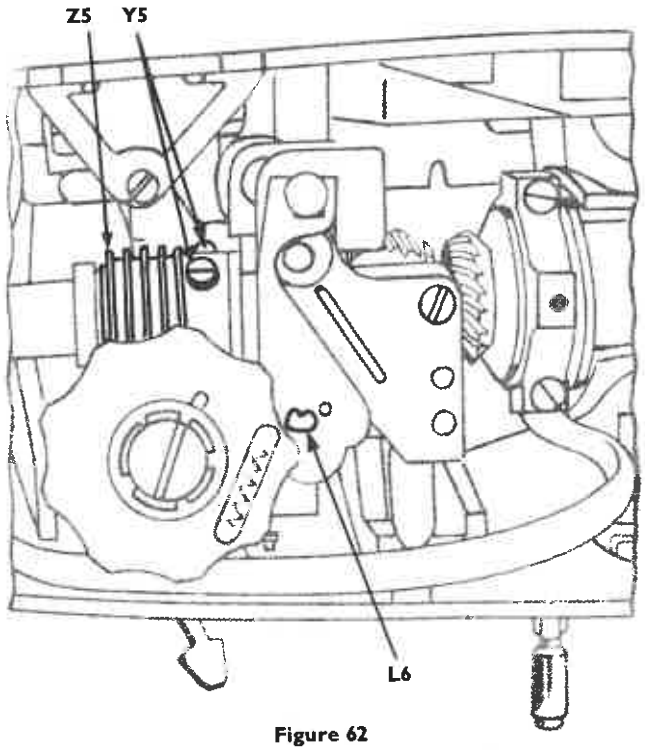


Figure 62
Adjustment for Correct Pendulum Movement

TO ADJUST THE CAM STACK

PREPARATION:

1. Remove arm top cover.
2. Set stitch width lever at "0".

CHECK:

Check for excessive end play or binding between arm shaft worm gear N6 and disc driving gear P6.

SETTING:

1. Remove indicator plate.
2. Loosen cam stack set screw Q6.
3. Insert screwdriver in slot of disc spindle R6 and turn spindle counter-clockwise to bring high point of eccentric toward arm shaft worm gear. Then "back-off" until there is no binding and minimum amount of backlash.
4. Tighten set screw Q6.

NOTE: Make one complete turn of cam stack to check for binding between the two gears.

5. Replace indicator plate and arm top cover.

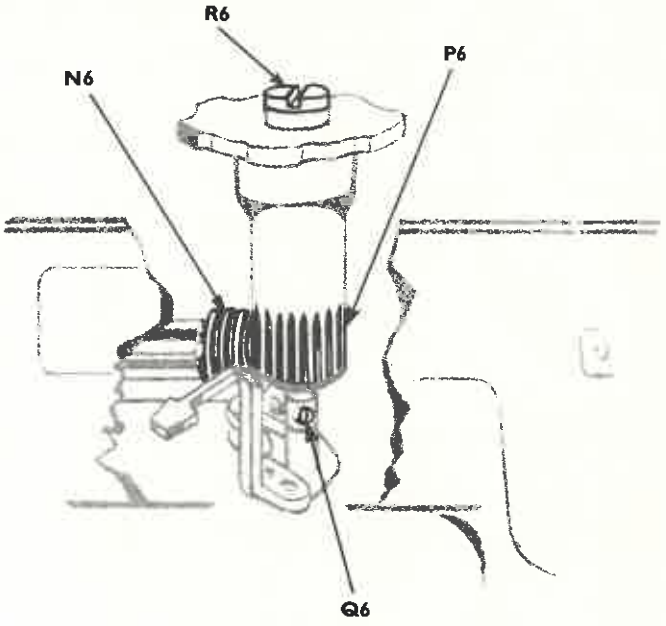


Figure 63
Cam Stack Adjustment

IMPORTANT:

Adjust stitch width lever for maximum width of zigzag stitch as follows:

1. Set stitch width lever at "4".
2. Loosen screw stud S6, Fig. 64.
3. Press needle bar driving arm H6 toward you (away from arm shaft) and at same time tighten screw stud S6.

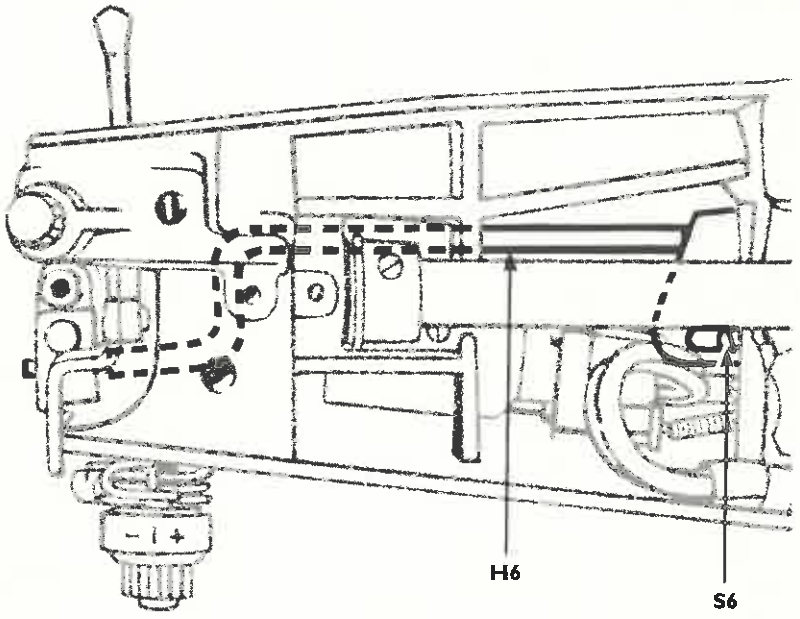


Figure 64
Stitch Width Lever Adjustment

TO ADJUST NEEDLE POSITION SELECTOR BRACKET ASSEMBLY

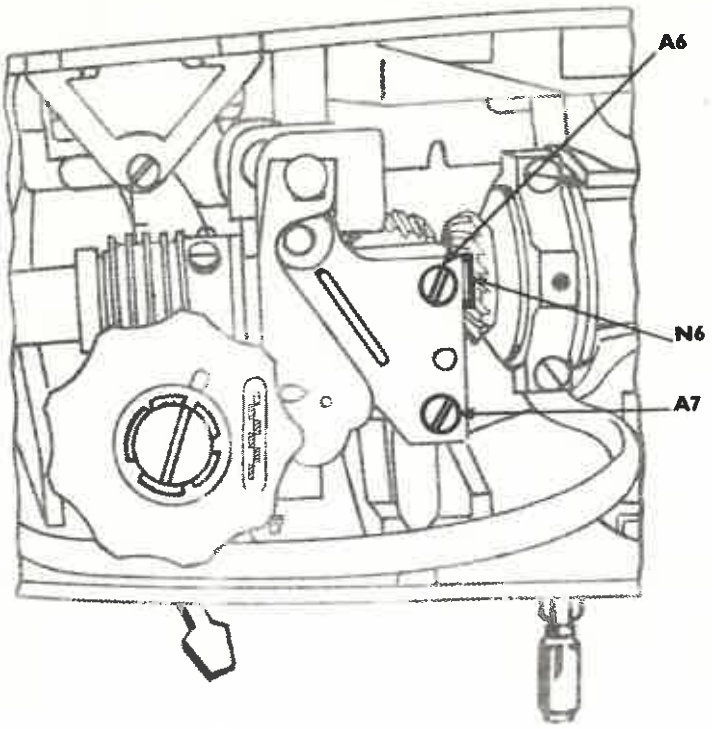


Figure 65
Adjusting Needle Position Selector Bracket

PREPARATION:

1. Remove arm top cover.
2. Insert general purpose throat plate.
3. Insert a size No. 9 needle up into needle clamp.
4. Remove Disc No. 1 (Zigzag) and replace with DISC No. 6 DOMINO. To remove disc, prise under disc retaining ring with a small screwdriver.
5. Turn hand wheel over toward you until disc follower is at low portion of DISC No. 6 (next to stitch pattern block) at specific position as indicated in Fig. 65 with needle bar at its lowest point, in centre needle position.

CHECK:

Move stitch width lever from left to right. While doing so, there should be minimum movement in needle bar.

SETTING: (See Fig. 65)

1. Set stitch width lever at "4".
2. Loosen bracket screw A6.
3. Turn hand wheel over toward you until disc follower is at low portion of DISC No. 6 (next to stitch pattern block) at specific position as indicated in Fig. 65 with needle bar at its lowest point, in centre needle position.
4. Move stitch width lever quickly from "1" to "4" and at same time, move selector bracket extension N6 toward left or right as required, until there is minimum movement in needle bar.
5. Tighten bracket screw A6.
6. If sufficient adjustment cannot be obtained adjust screw A7 in a similar manner.
7. Remove Disc No. 6 (Domino) and replace with Disc No. 1 (Zigzag).

CHECK:

Place a sheet of paper over throat plate. Set stitch width lever at "4". Lower and raise needle to make a slight perforation in the paper. Repeat this operation at setting of "0".

At correct adjustment of selector bracket N6, the needle will always enter the same perforation in paper at "0" and "4" setting.